Dolby® Lake® Controller Manual

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For users of software v.5.1

Dolby Laboratories, Inc.

Corporate Headquarters

Dolby Laboratories, Inc.
100 Potrero Avenue
San Francisco, CA 94103-4813 USA
Telephone 415-558-0200
Fax 415-863-1373
www.dolby.com

European Headquarters

Dolby Laboratories, Inc.
Wootton Bassett
Wiltshire SN4 8QJ England
Telephone 44-1793-842100
Fax 44-1793-842101

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Introduction

Dolby® Lake® Controller software provides a unified interface for the Dolby Lake Processor, Lake Contour™, and Lake Mesa Quad EQ™ processors. Optimized for a wireless touch-screen or tablet PC, the Controller uses a unique graphic interface that brings back the feel of analog faders and controls. The software operates on any Microsoft® Windows® PC with a standard Ethernet network interface.

1.1 Controller Overview

Using the Controller software, a sound engineer can control a distributed network of processors from a single location. Instant adjustments can be made to any parameter of any processor on the network, or to selected groups of processors. By creating groups, the Controller can deliver the appropriate EQ and level settings to a large, segmented sound system.

Each processor can be a member of more than one group. For example, a traditional arena-sized system comprises several left and right main stacks, side-, front-, and down-fills, and multiple levels of delays to different subsystems. Typical technology requires a chain of processing units to enable an overall stereo master and various submasters to individually control equalization, dynamics, and gain.

In contrast, the Controller can use multiple groups to send global adjustments to all PA areas while still providing independent control of individual system components.

1.2 Manual Overview

This manual provides software installation instructions, a tutorial for new users, and full-detail reference information for all software functions and features of the Dolby Lake Controller user interface.

The manual is organized as follows:

- Chapter 1, Introduction.
- Chapter 2, Dolby Lake Controller Installation, provides all the details for installing the Dolby Lake Controller software, setting up your video display, configuring your PC's networking interfaces for both wired and wireless operation, and verifying your connection to the Dolby Lake Processor hardware.
- Chapter 3, Dolby Lake Controller Tutorial, provides a tutorial that introduces you to the features of the software, and the terminology utilized in the user interface.
- Chapter 4, Home—Menu Reference, describes all of the top-level functions of the button bar located at the bottom of the Dolby Lake Controller user interface.
- Chapter 5, EQ/Levels—Menu Reference, details all of the functions found within the EQ/Levels menu. This menu provides the most commonly used functions within the Dolby Lake Controller.

- Chapter 6, System Store and Recall—Menu Reference, describes all menu functions related to saving and recalling system configuration files.
- Chapter 7, Modules—Menu Reference, details all of the functions found in the Modules menu, including how to save and recall module files, Super Module functionality, adjusting the I/O configuration of Modules and Super Modules, and accessing other module-specific functions.
- Chapter 8, Module File Types, provides a reference for all of the available module file types, including traditional crossovers, linear phase crossovers, and Mesa EQ™ modules.
- Chapter 9, Groups—Menu Reference, describes groups, which provide a sophisticated way to partition complex systems, enabling system-wide control of EQ and Levels in real time. This chapter details all functions related to creating and assigning modules to groups.
- Chapter 10, Solo/Mute—Menu Reference, details the functions associated with the Solo/Mute menu functionality.
- Chapter 11, Icon Control—Menu Reference, describes how to change the size of module icons within the interface, as well as how to change meter icon views.
- Chapter 12, User Preferences—Menu Reference, provides explanation of the various functions contained in the User Preferences menu, including access to Designer Mode, daylight operation, Show mode, and more.
- Chapter 13, Pages—Menu Reference, details the functions associated with adding and naming new page displays within the user interface.
- Chapter 14, Network—Menu Reference, shows you how to change between available networks, and details Multiple Controller functionality.
- Chapter 15, Communication and Synchronization, describes how the Dolby Lake Controller synchronizes to hardware processors, and provides explanations and suggestions on how to resolve issues that may arise due to network problems, such as moving out of range of a wireless access point.
- Chapter 16, Keyboard Shortcuts Reference, details all keyboard shortcuts provided.
- Chapter 17, External Control Interfaces, describes the available external-control interfaces supported by the Dolby Lake Controller, including AMX®, Crestron®, and MIDI.
- Chapter 18, Designer Mode Reference, details all of the security features provided by the Designer Mode of operation.
- Chapter 19, Firmware Upgrade Process, presents the methods in which you can update the firmware of your hardware processors using the Controller and associated utilities.

If you are using the Controller for the first time, we recommend reading through the tutorial in Chapter 3 to become familiar with the features and terminology. For information on Processor hardware, please refer to the *Dolby Lake Processor System Manual*.

The information in this manual is based on the use a tablet PC, which utilizes a pen interface instead of a mouse. Therefore the word *tap* is used instead of *click* when referring to tapping the pen on the screen, which is equivalent to tapping the left mouse button. If you are using a mouse instead of a pen, simply substitute a click of your mouse when you see the instruction to *tap*.

Dolby Lake Controller Installation

These installation instructions are based on the assumption that you have some knowledge of basic Microsoft® Windows® concepts, such as how to select menu items, locate folders and files, and run programs. For more information on Windows, please consult your Windows documentation.

Before installing the Dolby® Lake® Controller software, please read the license agreement presented at the beginning of the installer.

2.1 Computer Requirements and Configuration

2.1.1 Recommended PC Specifications

- 1GHz or faster
- 512 MB RAM or greater
- 128 MB video RAM or greater
- Windows XP or Windows Vista
- Microsoft DirectX® 8.1 or later (preinstalled with Windows XP)
- 100Base-T wired Ethernet adapter and/or 802.11 wireless Ethernet adapter

Wireless networking requires the preconfigured wireless networking package available from Dolby (or equivalent).

2.1.2 Video Card Settings

It is important that the video card is configured correctly to ensure smooth operation of the Dolby Lake Controller software. Incorrect video card settings may result in problems or unusual behavior of the graphics display on the Controller.

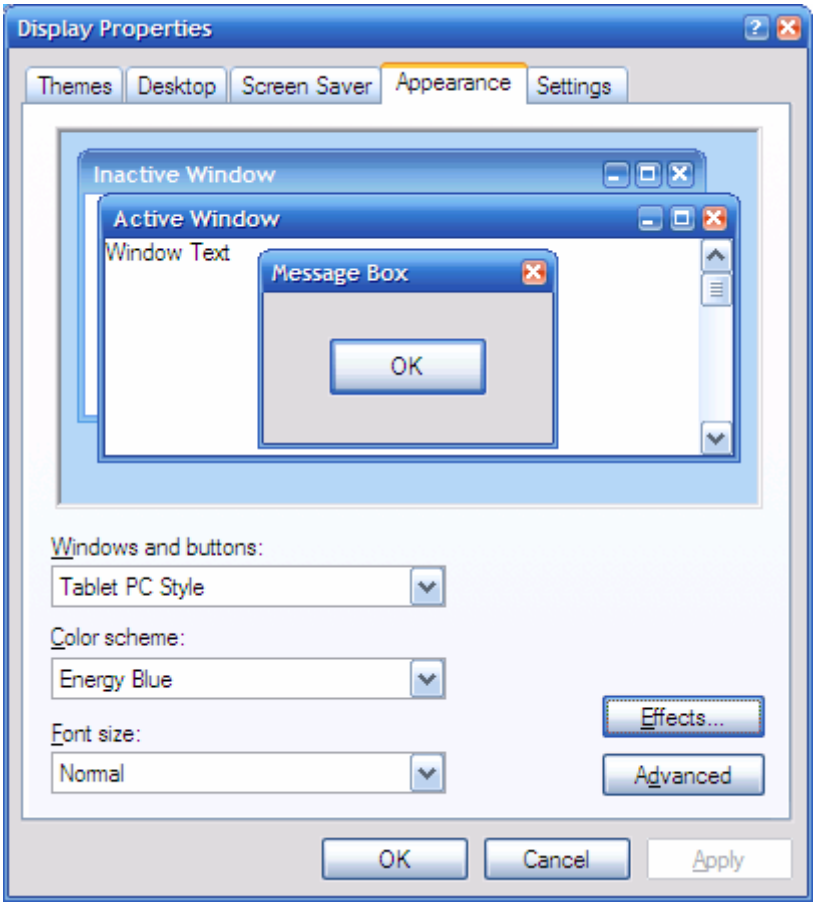
In addition to the settings presented below, please visit your video card manufacturer's website and download the latest drivers for your specific video card. The video drivers that come preinstalled as part of your Windows distribution are usually out of date and do not include enhancements provided by the video card manufacturer's drivers. Almost all video card issues can be resolved by updating your video card driver to the latest release version.

Recommended video card settings:

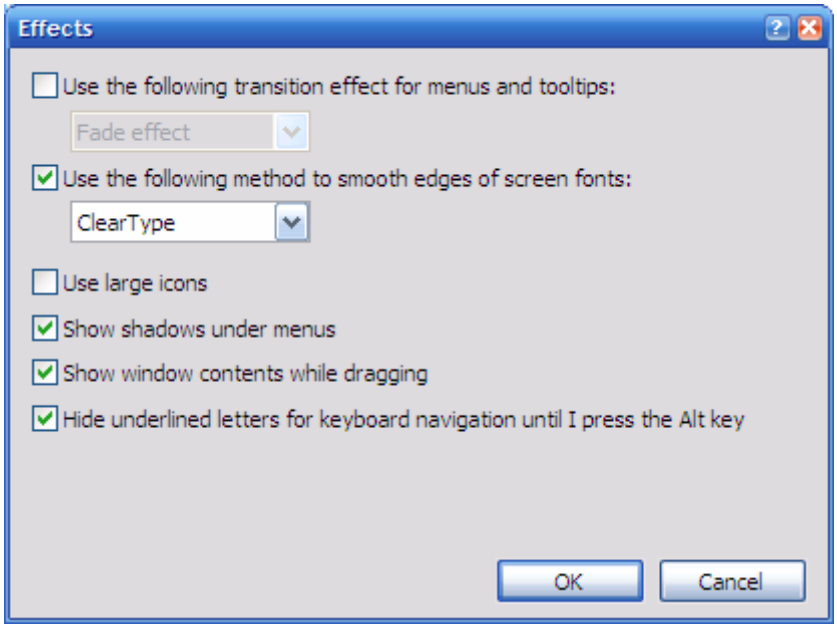
- Display resolution—1,024 by 768 pixels; 800-by-600-pixel resolution is supported but provides a lower-quality interface with some features less accessible or unavailable.
- Color—16 bit.
- 3D acceleration—Set for best performance with antialiasing turned off.
- ClearType®—Enabled (Windows XP only).

1. To verify your display settings, navigate to **Display Properties** using the Windows Control Panel:

Start Menu → Settings → Control Panel → Display → Display Properties, Appearance



2. Tap the **Effects…** button to open the following dialog box and confirm that **ClearType** has been specified and selected.


Effects
Use the following transition effect for menus and tooltips:
Fade effect
Use the following method to smooth edges of screen fonts:
ClearType
Use large icons
Show shadows under menus
Show window contents while dragging
Hide underlined letters for keyboard navigation until I press the Alt key
OK
Cancel

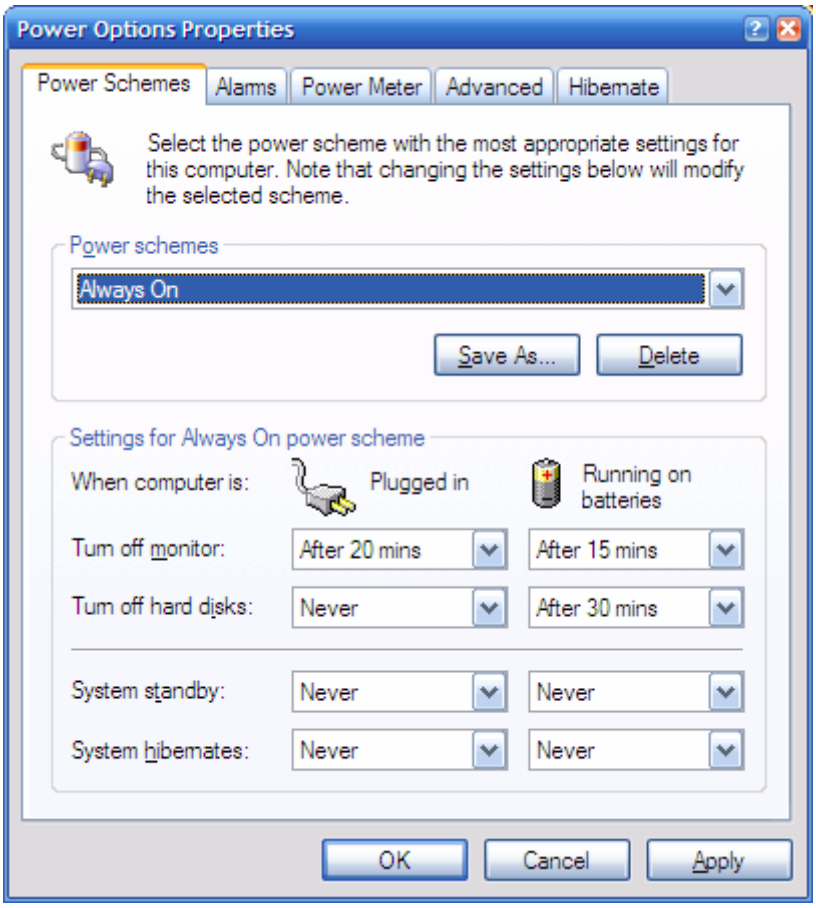
2.1.3 Tablet PC and Laptop Power Settings

When using a wireless tablet or laptop PC with the Dolby Lake Controller, you may need to switch off power-saving features, which can reduce the performance of your PC.

If you experience slower performance while using the Controller on battery power, turn off any battery power-saving settings that affect general performance of your PC. Some battery optimizations also affect wireless connection speed; if you experience a slow wireless connection while in Battery mode, these settings should be disabled.

To turn off power-saving features, navigate using the Windows Control Panel:

Start Menu → Settings → Control Panel → Power Options



As settings vary depending on each tablet or laptop, please consult the appropriate hardware manual for further information.

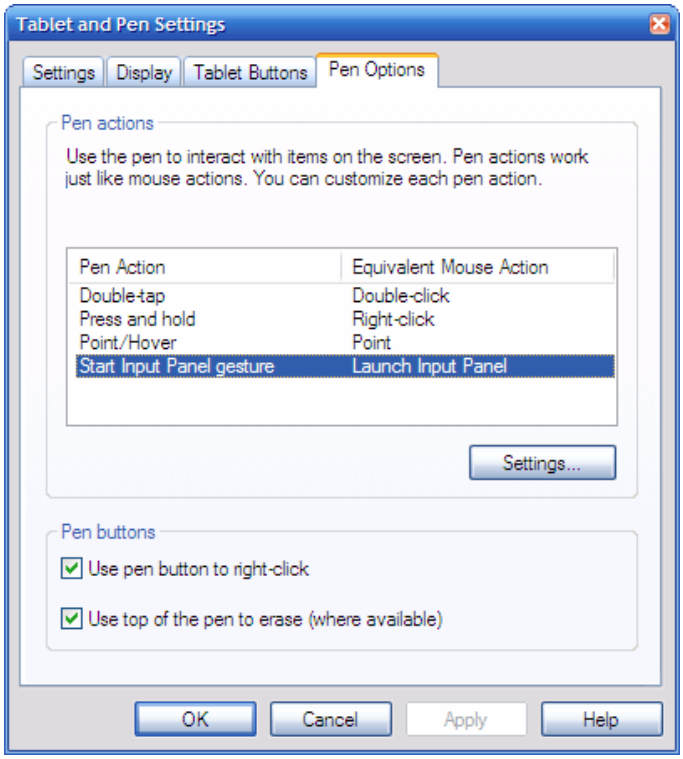
2.1.4 Tablet PC Input Panel Settings

Windows XP Tablet Edition provides the pen action **Start Input Panel gesture**, which starts the tablet Input Panel (keyboard or writing pad). This gesture is a quick movement of the pen from side to side. If the Input Panel appears while using the Dolby Lake Controller, it will cause flickering because both the Controller and the Input Panel attempt to be in the foreground.

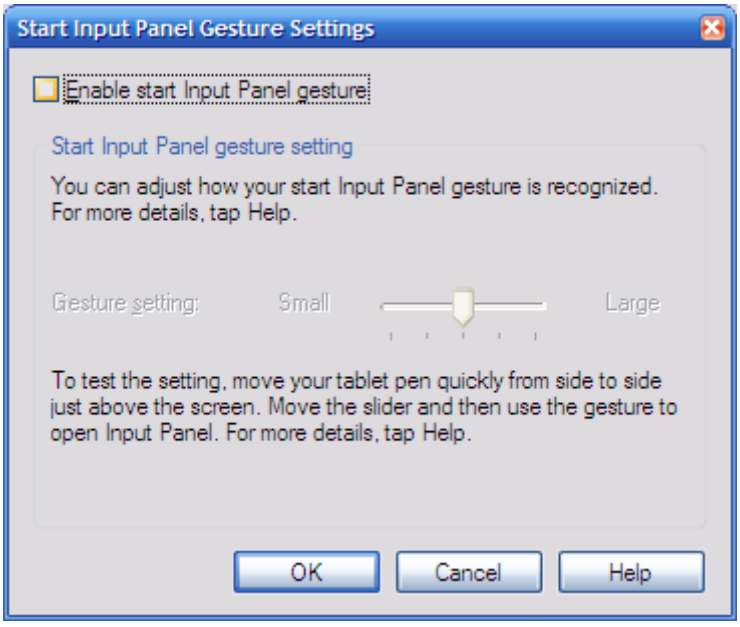
To disable the Input Panel gesture:

1. Access Tablet and Pen Settings through the Windows Control Panel.
   Start Menu → Settings → Control Panel → Tablet and Pen Settings, Pen Options

2. Select the **Pen Options** tab.



3. Select **Start Input Panel gesture**, and tap **Settings**.


Start Input Panel Gesture Settings
Enable start Input Panel gesture
Start Input Panel gesture setting
You can adjust how your start Input Panel gesture is recognized. For more details, tap Help.
Gesture setting:
Small
Large
To test the setting, move your tablet pen quickly from side to side just above the screen. Move the slider and then use the gesture to open Input Panel. For more details, tap Help.
OK
Cancel
Help

4. Uncheck the box labeled **Enable start Input Panel gesture**.
5. Tap **OK**.
6. Tap **OK** again to save your changes.

2.2 Software Installation

To install the Dolby Lake Controller, insert the CD-ROM into the CD-ROM drive. The first time you do this, the AutoPlay feature will present a dialog box. To run the Setup program, choose **Install Dolby Lake Controller**, and then follow the instructions that appear on the screen.

Alternatively, if you have downloaded the Dolby Lake Controller software installer from the Internet, double-tap the installer executable to start the installation process.

The Dolby Lake Controller Setup program will guide you through software installation.

1. Read and enter installation information as required, and tap **Next** to proceed through the installation dialog boxes.
2. Tap **Install** when requested.
3. Tap **Finish** when installation is complete.

Following successful installation, the Dolby Lake Controller icon appears on the desktop.

Note: Before using the Dolby Lake Controller with a network of hardware processors, please follow the configuration procedures described in Section 2.3.

2.3 PC Networking Setup

2.3.1 How Networking Works

The TCP/IP protocol suite is structured in layers as illustrated in Figure 2-1. The link layer is Ethernet and is responsible for connecting to the cabling and Ethernet switches. For communication to occur, each device must have a valid IP address. The IP layer uses these addresses to route packets between devices. The transport layer provides flows of data and is used by applications to communicate with each other over the network.

The Dolby Lake Controller uses UDP messaging to communicate with Dolby Lake Processors on the network. Network setup and configuration is fast and easy; simply hook up all the devices on the network, and the Dolby Lake Controller software detects and communicates with all devices as required.

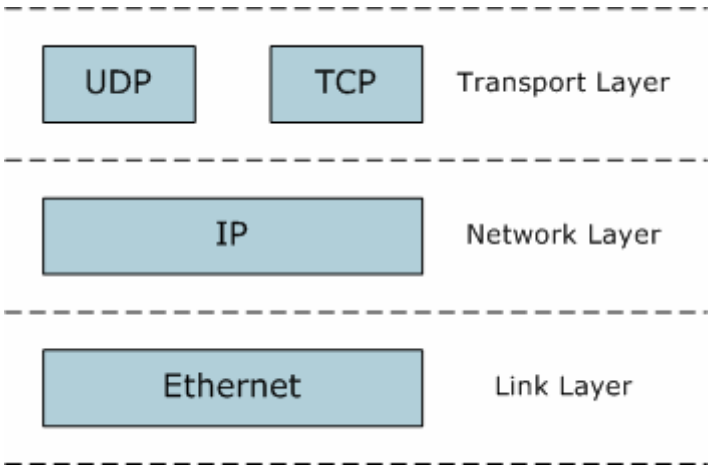


Figure 2-1 TCP/IP Protocol Suite

All hardware Dolby Lake Processors are configured to use Automatic Private Addressing which allocates IP addresses from the range 169.254.x.x. In most scenarios, this automatic allocation setting will not need to be changed. However, if the Processors will be part of a more sophisticated network setup as part of a larger installation, you can change the IP address allocation method using the Dolby Lake Controller software.

2.3.2 IP Address Configuration

The network card of the host computer running the Dolby Lake Controller must have a valid IP address to communicate with Dolby Lake Processors on the network.

By default, Windows computers are configured to obtain an IP address automatically. This default setup works successfully for most configurations and is the recommended starting point. On an unmanaged network this option will allocate the PC an IP address from the range 169.254.x.x.

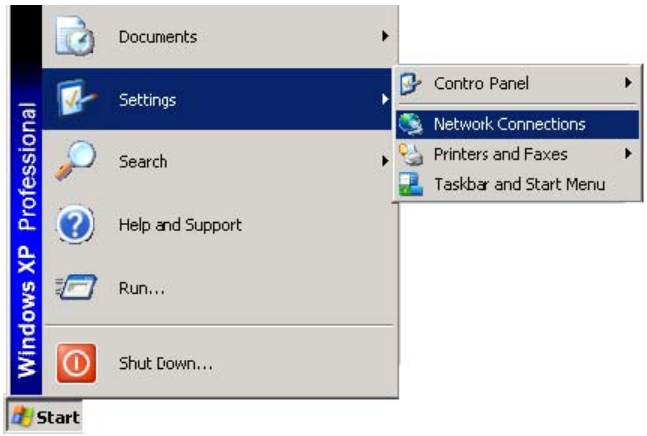
If using automatic IP address allocation, please ensure your Ethernet switch and/or Dolby Lake Processors are turned on and connected to your PC for a minute or so before starting the Dolby Lake Controller. This allows Windows time to correctly identify your PC's IP address, and therefore allows the Dolby Lake Controller to communicate properly when it scans the network.

If you are on a managed network (such as a corporate network) with a DHCP server and you are having communication problems, it is recommended that you change the IP addressing mode on the Processors to use DHCP. Please consult a network specialist if you have trouble with complex network configurations.

A fixed IP address is useful if you are frequently switching between network adapters, or unplugging and replugging your network cable. The automatic IP address allocation used by Windows requires a valid network to be present, and can take around one minute for the PC to discover its IP address. In this case it is recommended that you try using a fixed IP address, for example in the 10.10.x.x range, with a subnet mask of 255.255.0.0.

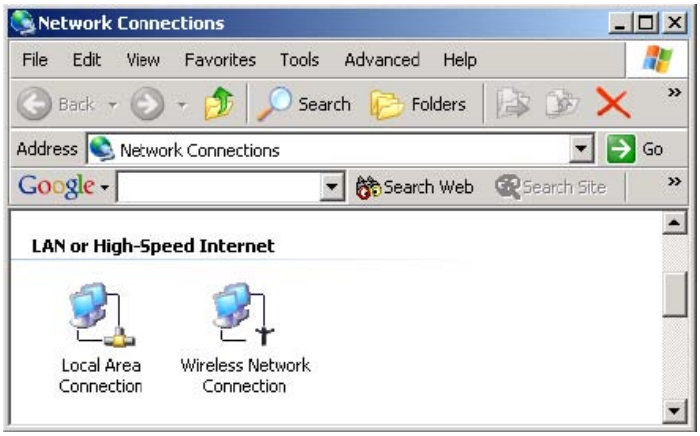
You can specify a fixed IP address by following these steps:

1. Open **Network Connections** from the Windows **Start** menu.

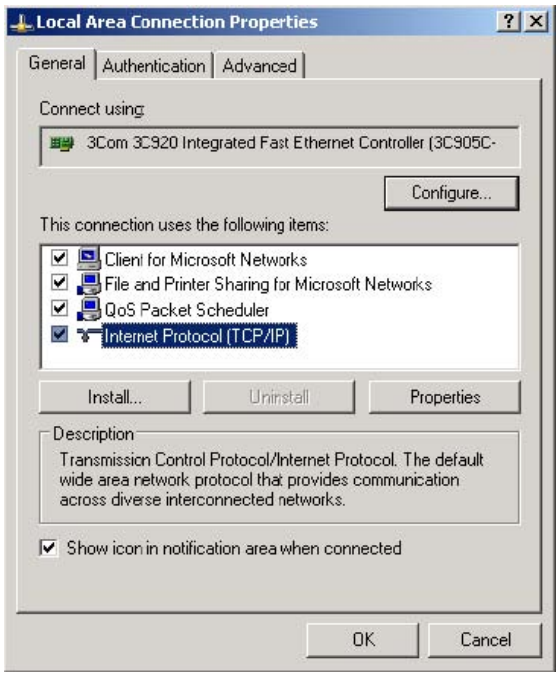


2. Double-tap the appropriate network connection (**Local Area Connection** or **Wireless Network Connection**) to configure.

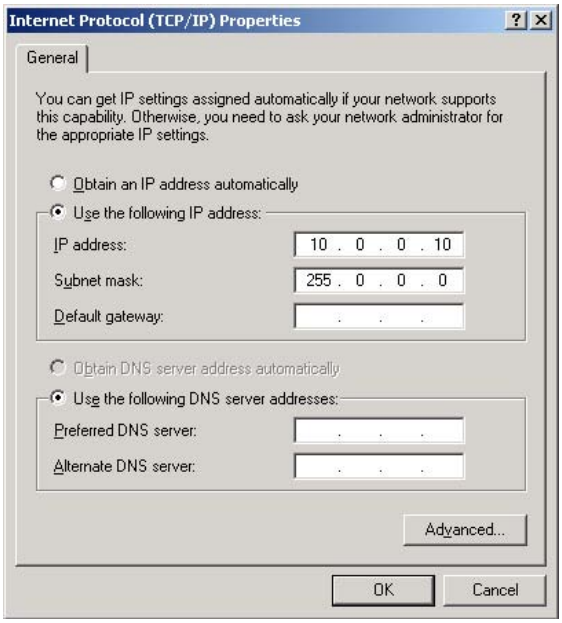
Note: Although this tutorial uses Local Area Connection as an example, the principles also apply to Wireless Network Connection.



3. Select **Internet Protocol (TCP/IP)**, and tap the **Properties** button.



4. Select "Use the following IP address," then enter a class A, B, or C fixed IP address and appropriate subnet mask.


Internet Protocol (TCP/IP) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
10 . 0 . 0 . 10
Subnet mask:
255 . 0 . 0 . 0
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel

5. Tap **OK** to apply changes, and exit **Internet Protocol (TCP/IP) Properties.**
6. Tap **OK** to apply changes, and exit **Local Area Connection Properties**.

Note: Please refer to Appendix A for more information on the selection of an appropriate IP address.

2.3.3 Wired Network Setup

The Dolby Lake Controller host computer can be connected directly to any Dolby Lake Processor through either its front- or rear-panel Ethernet connectors. Multiple Processors can be connected by cascading connections between units, This is not a recommended network setup for the successful use of Dante (Digital Audio Networking via Ethernet). Connecting devices via a good quality external Ethernet switch is recommended. Please refer to Section 2.3.9 for further information.

The devices can be interconnected using a wired or wireless network. The wired network is a simpler solution and should be implemented in preference to using a wireless system. If Contour™ Pro26/Mesa Quad EQ™ Processors are being used in conjunction with Dante, additional configuration of an external Ethernet switch is required to filter Dante audio traffic from reaching these 10 Mbps devices. Please refer to Section 2.3.8.

The Controller can connect anywhere on a network of multiple Processors. LEDs next to each port flash to confirm valid communication. Please connect the Controller computer to the network with an Ethernet cable, and follow the verification steps in the next section.

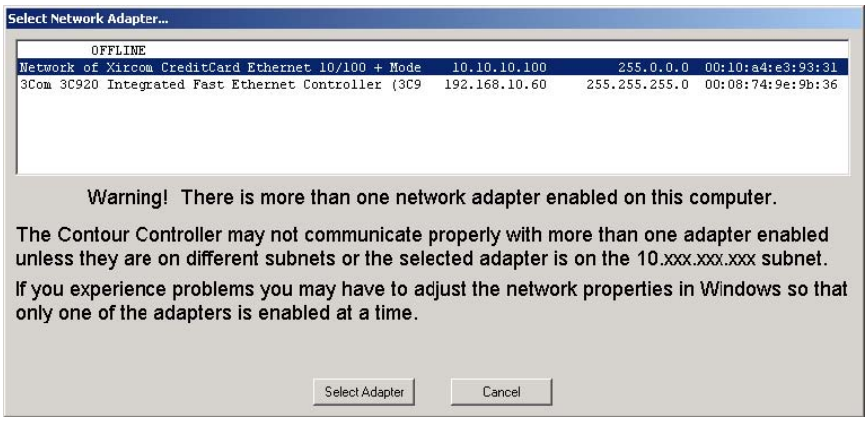
2.3.4 Verifying Controller and Processor Communication

Once the network is connected, follow these steps to confirm communication between the Dolby Lake Controller and Dolby Lake Processors:

1. Double-tap the Dolby Lake Controller shortcut icon from the Windows desktop. The **Select Network Adapter** dialog box (shown) appears if your computer has more than one network interface enabled. This typically occurs if your PC has both wired and wireless network interfaces.

Note: It is recommended that only one network adapter be enabled on your PC when using the Dolby Lake Controller software. Network adapters can be disabled by right-clicking the relevant adapter via the Windows Start > Control Panel > Network Connections and choosing **Disable.**

2. Select the Ethernet adapter currently used for the network (the wired adapter for this example).


Select Network Adapter...
OFFLINE
Network of Xircom CreditCard Ethernet 10/100 + Mode 10.10.10.100 255.0.0.0 00:10:a4:e3:93:31
3Com 3C920 Integrated Fast Ethernet Controller (3C9 192.168.10.60 255.255.255.0 00:08:74:9e:9b:36
Warning! There is more than one network adapter enabled on this computer.
The Contour Controller may not communicate properly with more than one adapter enabled unless they are on different subnets or the selected adapter is on the 10.xxx.xxx.xxx subnet.
If you experience problems you may have to adjust the network properties in Windows so that only one of the adapters is enabled at a time.
Select Adapter
Cancel

When the Controller begins, you will be prompted with a dialog box asking whether to load the last configuration.

3. Tap **No** to this dialog. The **Main** page of the Controller displays.
4. To verify that the Processors are on the network and communicating, tap the **Modules** button. The module scroll bar displays.

The icons on the left of the module scroll bar represent virtual frames, which are always available whether or not the network is connected. Virtual frames allow you to create a complete system configuration offline.

If your network connections are valid, all Processors connected to the network appear on the module scroll bar to the right of the virtual frames.

In the previous figure, the A, B, C, and D modules are encircled in a *frame* that visually represents one Dolby Lake Processor operating in Loudspeaker Processor mode. When operating in EQ mode, the Processor is shown as eight module icons in one frame. The number of processing modules shown in the scroll bar depends on the configuration of your Processor. Please refer to the tutorial in Chapter 3 for more information on modules and frames.

2.3.5 Wireless Network Setup

Several hardware manufacturers supply wireless networking solutions that adhere to the various 802.11 wireless Ethernet standards. This means that any standard Ethernet 802.11 wireless networking solution should work with this network system.

However, after extensive testing of available wireless networking solutions, we have found that performance varies tremendously among vendors. A trouble-free, preconfigured wireless networking package is available from Dolby. Please visit www.dolby.com/livesound for further information.

When using a wireless access point on the same network as Dante digital audio, an approved external Ethernet switch must be configured to filter Dante audio packets from reaching the wireless network. Please refer to Section 2.3.8 for further information.

Note: Although the following instructions are specific to the preconfigured wireless networking package available from Dolby, the majority of the concepts and terminologies translate directly for other 802.11 solutions.

An access point is used in a wireless Ethernet network configuration to connect Dolby Lake Processors to the Dolby Lake Controller host computer. An access point looks like an external modem with two small antennas. This radio-based receiver/transmitter is connected to the wired network using standard Ethernet cables. It performs the same function as a switch: receiving, buffering, and transmitting data between wired and wireless networks.

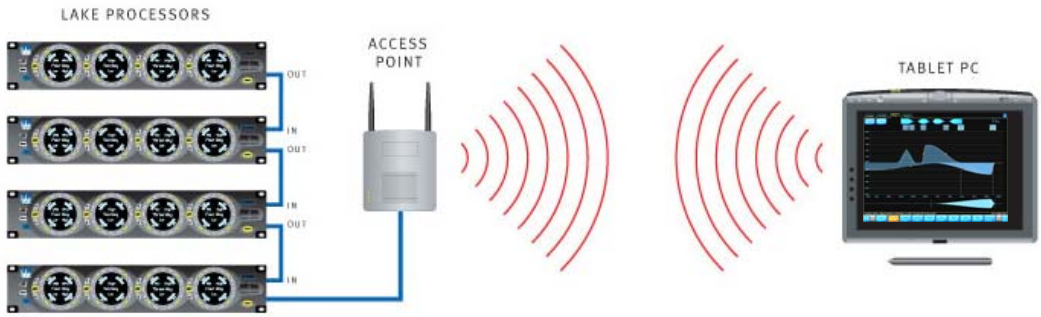


Figure 2-2 Basic Wireless Setup (Not Suitable for Use with Dante)

Ideally, the procedure just described yields a perfectly functional and secure system. However, there are two complications: Some environments have additional wireless network systems and communications equipment competing for the same airspace used by the Dolby Lake system. It is also important to provide security so another wireless network cannot access this network system.

As part of the 802.11 standard, various levels of access control and encryption exist. There are also different communication channels that operate at different frequencies.

The service set identifier (SSID) controls access to this wireless network by functioning as a password or key between wireless network devices to differentiate them from each other. The SSID must be exactly the same on all wireless devices (the access point and all Controller host computers). The SSID is case sensitive.

Although the SSID differentiates among wireless systems, it does not provide security to the network. Wired Equivalent Privacy (WEP) is a security protocol for wireless networks defined in the 802.11 standard. The WEP protocol provides the same level of security as a wired network by encrypting data over radio waves to protect it during transmission.

The preconfigured networking package sets the SSID for you. The SSID can be found on the back of preconfigured access points, and is a number unique to your wireless access package.

WEP encryption is not enabled. This should be necessary only if you plan on using an existing LAN that includes sensitive information. We recommend that WEP encryption be enabled if any other computers are connected to your Ethernet network.

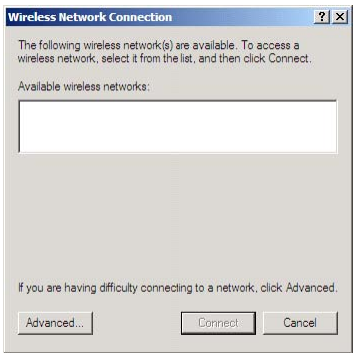
To make a connection between the Controller PC and the access point, locate the SSID found on the label on the back of your access point. If you are using an access point that has not been preconfigured, please refer to your specific access point's documentation for further information.

2.3.6 Configuring the Tablet PC for Wireless Networking

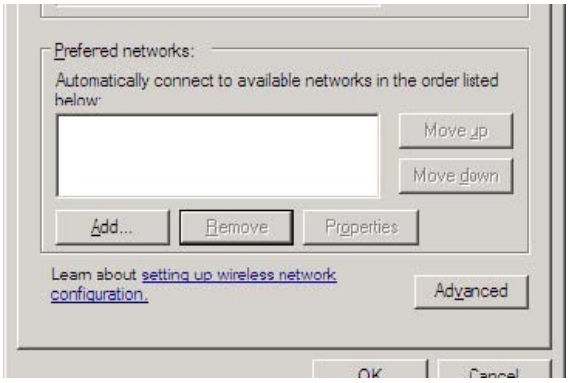
Assuming that the access point has been preconfigured and set up appropriately, we now need to configure the tablet PC to connect to this access point.

To configure the tablet PC:

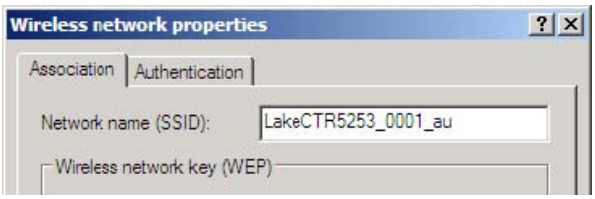
1. Open **Network Connections**, and double-tap **Wireless Network Connection**.


Wireless Network Connection
The following wireless network(s) are available. To access a wireless network, select it from the list, and then click Connect.
Available wireless networks:
If you are having difficulty connecting to a network, click Advanced.
Advanced...
Connect
Cancel

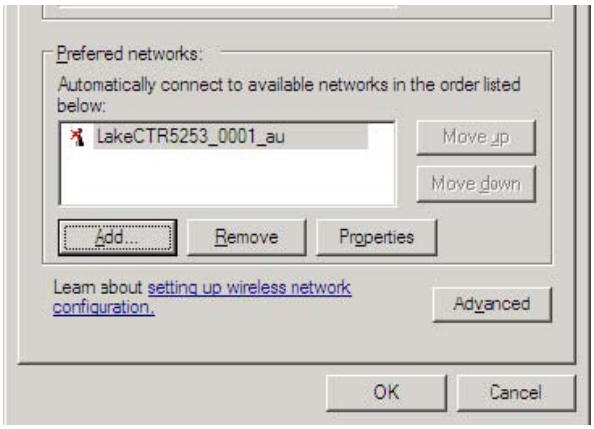
2. Tap **Advanced…**, then tap **Add** to add a preferred network.



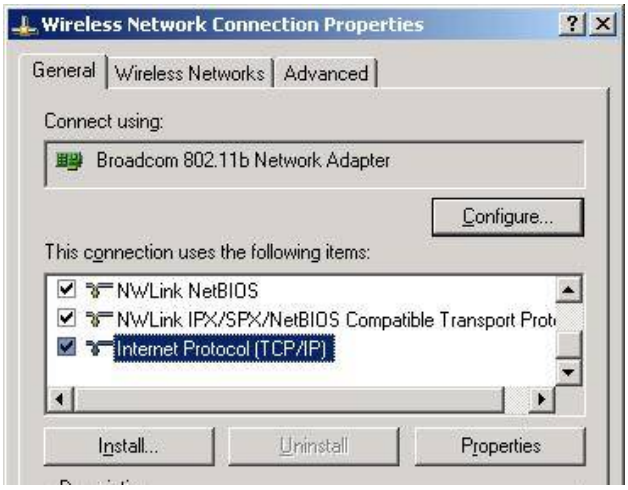
3. Specify the network name, exactly as you have it configured on the access point. Remember the SSID is case sensitive.



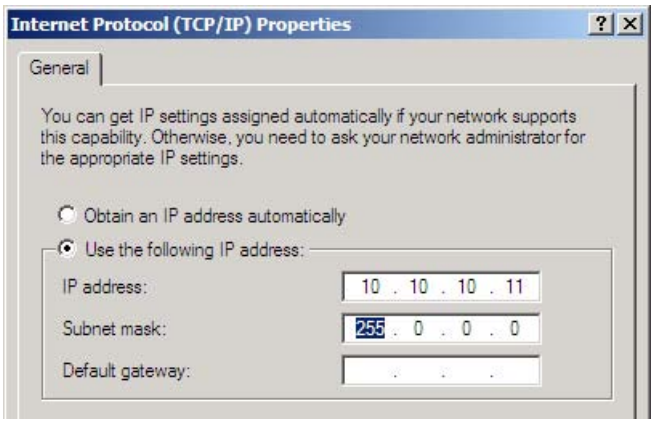
4. Tap **OK** to continue. The SSID will now appear in the **Preferred networks** list.



5. Select the **General** tab, scroll down to **Internet Protocol (TCP/IP)**, and tap **Properties**.

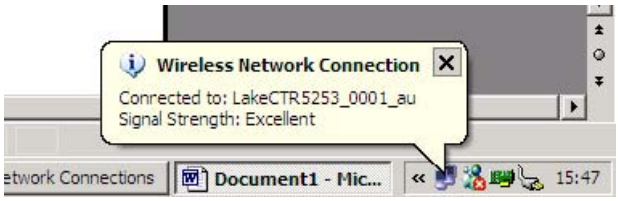


6. If this screen shows "Obtain an IP address automatically" and you are encountering problems, enter a class A,B, or C fixed private IP address, and appropriate subnet mask, ensuring it is unique. (Do not use the same IP address that you allocated to the access point.) Tap **OK**.


Internet Protocol (TCP/IP) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
10 . 10 . 10 . 11
Subnet mask:
255 . 0 . 0 . 0
Default gateway:

Note: Please refer to Appendix A for more information on the selection of an appropriate IP address.

7. Tap **OK** again. A pop-up message will appear in the Windows icon tray.



2.3.7 Confirming Wireless Operation of the Dolby Lake Controller

To confirm wireless operation:

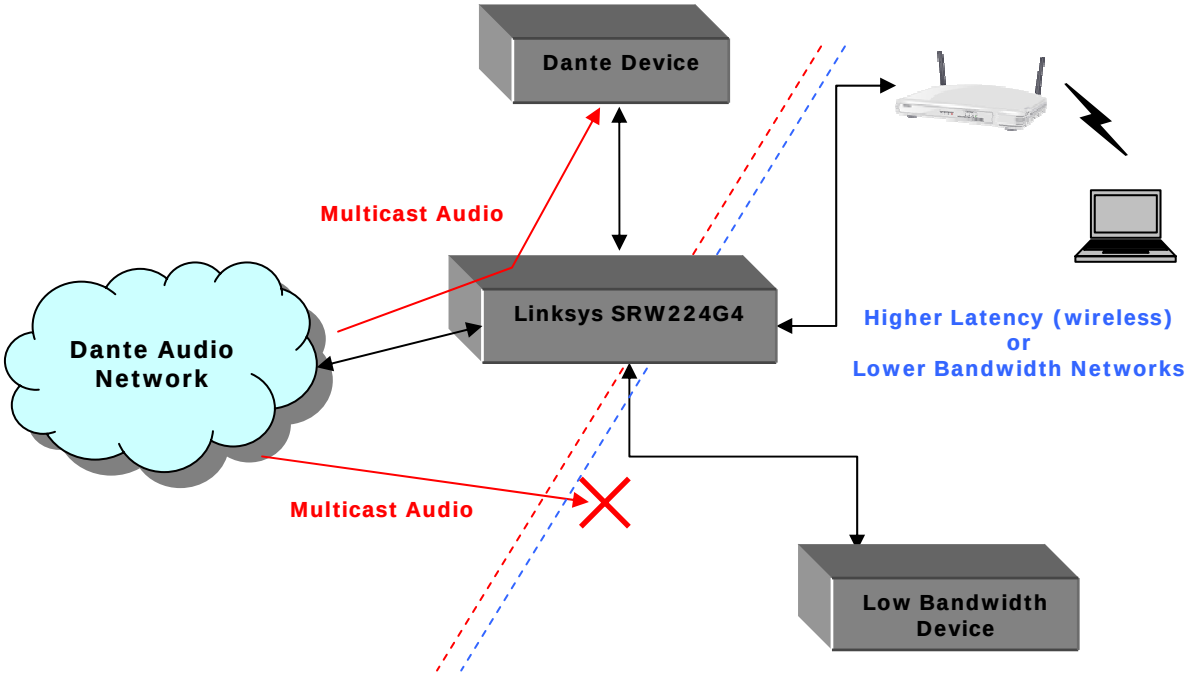
1. Double-tap the Dolby Lake Controller icon to start the software. If you have more than one network adapter enabled, the **Select Network Adapter** dialog box will be displayed; select **Wireless Network Adapter**.
2. Tap **No** when asked whether to recall the last configuration. A brief resync message will appear for each Dolby Lake Processor on your network, confirming that your network connection is operating properly.
3. Tap **Modules**. Each online Processor is represented on the module scroll bar as two module icons surrounded by a frame.
4. Tap **Quit Controller** to exit.

2.3.8 Using Dante in Conjunction with Wireless Data Control or Low-Bandwidth Devices

Dante (Digital Audio Networking) technology requires a 100 Mbps network to operate, and therefore cannot operate via a wireless transmitter/receiver. However, it is likely in a Dolby Lake network that wireless control of the Dolby Lake Processors is required on the same network that is transmitting and receiving Dante digital audio signals.

To achieve this, you must configure the Ethernet switch on the boundary of the wireless network to filter Dante traffic from reaching the 10 Mbps access point or other lower bandwidth devices such as Contour Pro26/Mesa Quad EQ Processors, or you will most likely experience communication problems.

The diagram below summarizes the desired outcome from correctly configuring your Ethernet switch to filter Dante audio packets.

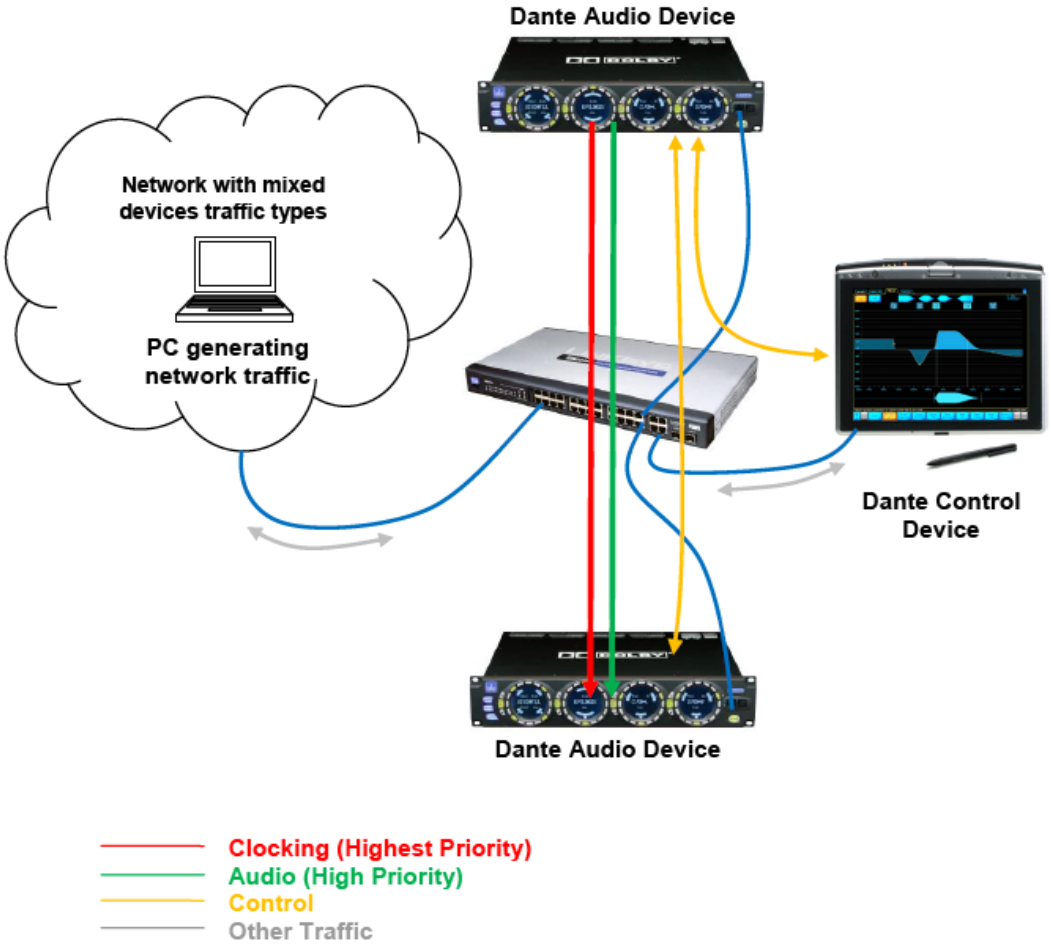


Please refer to the Audinate document AUD-ANO-ACL_Filtering_SRW224G4-V2.4.pdf for further details regarding filtering, located in the Literature section of the Dolby Lake Controller software installer, or from our software download request page:
http://www.dolby.com/professional/live_sound/support_download/lsdr_form.aspx

Or find further Dante support information on the support forum:
http://livesoundforum.dolby.com/

2.3.9 Dante with Quality o Service Ethernet Switches

The use of an external Ethernet switch with QoS (Quality of Service) is strongly recommended when using Dante digital audio over your Dolby Lake network. Dante uses standard network QoS techniques available in off-the-shelf Ethernet switches to prioritize clocking and audio traffic, and to allow non-Dante devices such as personal computers to share a single network with Dante devices. The diagram below shows the order of priority given to the different types of data packets going through the switch. Using a switch without QoS, or with QoS turned off on a busy network, may result in audio packets arriving too late to be played out, resulting in audio glitches.

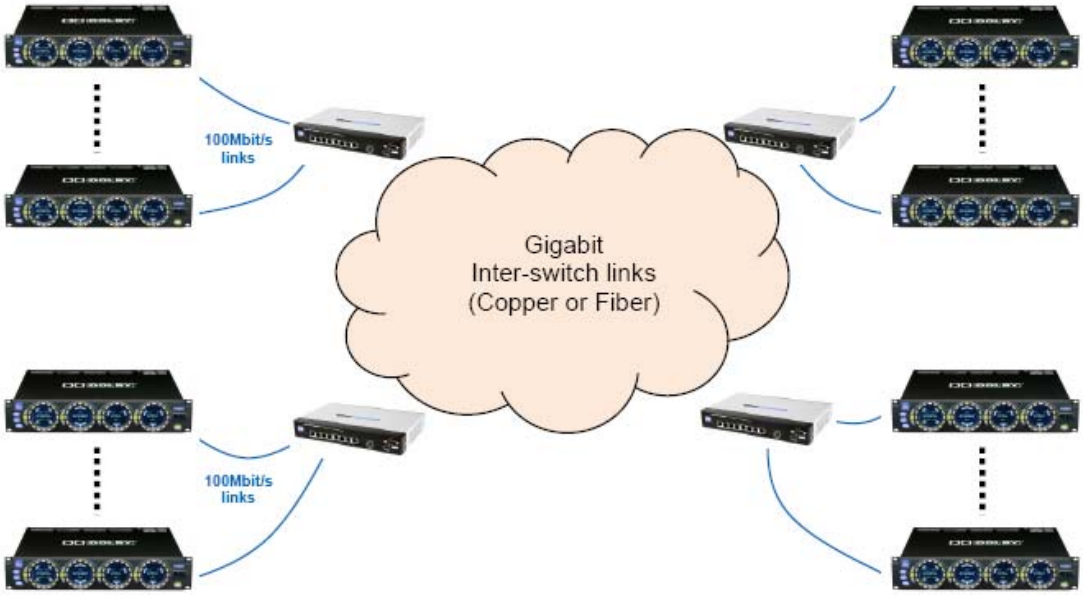


Please refer to the Audinate document AUD-ANO-QoS_Switch_Configuration-Dolby-V1.1.pdf for further details regarding QoS, located in the literature section of the Dolby Lake Controller software installer, or from our software download request page:
http://www.dolby.com/professional/live_sound/support_download/lsdr_form.aspx

Or find further Dante support information on the support forum:
http://livesoundforum.dolby.com/

2.3.10 Recommended Network Topologies When Using Dante

The use of an external Ethernet 100 Mbps switch with QoS (Quality of Service) is highly recommended. It is also recommended that each processor has its own direct connection to that switch. Where switches are connected together, this should be achieved via a gigabit fiber or copper connection.



Two Dolby Lake Processors may be daisy chained together and run Dante.

Recommended Latency: 0.8ms

More than two Dolby Lake Processors should not be daisy chained together when Dante is being used.

The use of Dante across wireless networks as shown below is not supported.

Please refer to the Audinate document AUD-ANO-QoS-RecommendedNetworkTopologies-V1.2.pdf for further details regarding network topologies, located in the Literature section of the Dolby Lake Controller software installer, or from our software download request page:

http://www.dolby.com/professional/live_sound/support_download/lsdr_form.aspx

Or find further Dante support information on the support forum:

http://livesoundforum.dolby.com/

Dolby Lake Controller Tutorial

This tutorial will help you start using the Dolby® Lake® Controller software quickly and easily by providing an overview of common features. There are many underlying details not covered in this tutorial, so please refer to the other sections of this manual for detailed reference information.

The tutorial examples will guide you through basic setup procedures. You must have at least one Dolby Lake Processor connected to the Controller to proceed with this tutorial. Additionally, the tutorial is based on the assumption that you are starting with a factory reset Processor, which is the configuration that runs when you first power on your Processor out of the shipping container. If necessary, please refer to the *Dolby Lake Processor System Manual* for information on how to restore the factory configuration.

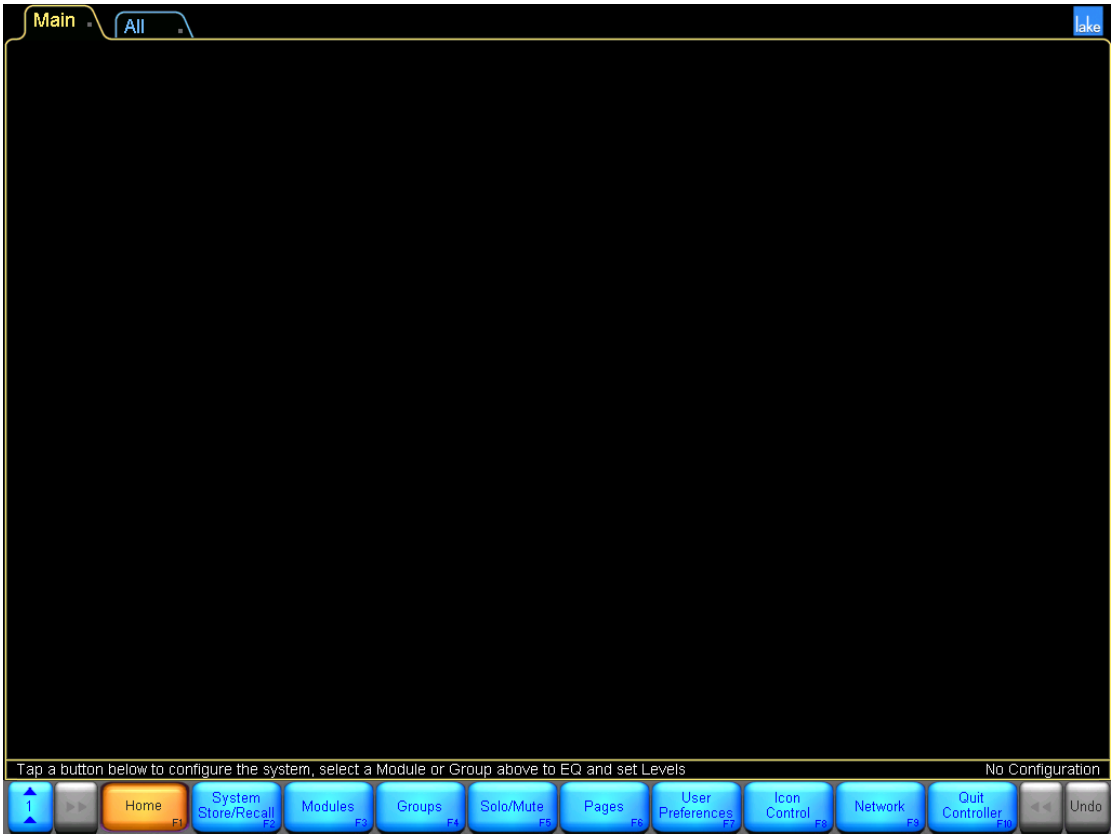
3.1 Starting the Dolby Lake Controller

To start the Dolby Lake Controller:

1. Double-tap the Dolby Lake Controller software icon located on the Microsoft® Windows® desktop.
2. Tap **No** in the dialog box asking if you would like to recall the last configuration.

Note: Tapping **Yes** loads the configuration that was in use the last time the Controller software was closed. This configuration is then compared to what is found on the network, and any differences are distinguished in the software. No audio processing will be affected by recalling the last known configuration.

The **Main** page appears and is in its default, blank state.



3.2 Overview of Main Page Components

This section covers the various components shown on the main page.

3.2.1 Button Bar Interface

The button bar, located at the bottom of every page in the software, is used to navigate through and activate the Dolby Lake Controller features and functions. Three colors indicate the button status:

Orange—Currently selected menu or function

Blue—Available menu or function based on current selection

Gray—Currently unavailable menu or function

The following buttons are always available on the left side of the button bar:

The button with the numbered arrows pointing upward is the **Context** button, which enables fast system navigation. Contexts allow you to jump directly from one view to another view without having to use the toolbar for navigation. For further detail, please refer to Section 12.1.

The button with arrows pointing right is active when a page or menu scroll bar contains more information than can be displayed on the width of the screen. Tap this button to move the scroll bar, pages, or overlay tabs to the right, revealing additional data.

The **Home** button is available from almost all menu levels, and returns you to the **Main** page of the system.

The following buttons are always available on the right side of the button bar:

The button with arrows pointing left moves the scroll bar, pages, or overlay tabs to the left, revealing additional data.

The button labeled **Undo** (or **Redo** after Undo has been used) provides a single-level Undo/Redo function for adjustments made to EQ/levels and crossovers (where applicable).

Generally, the labels on buttons describe the submenu opened or the function performed by tapping the button.

3.2.2 Help and Status Messages

Context-sensitive help is displayed above the button bar on the left.

System status messages are displayed above the button bar on the right. In the following example, the network status is shown to be offline.

3.2.3 Page Tabs

At the top left of the user interface, the **Main** tab and **All** tab are presented. The **Main** page is the default page ready to use. The **All** page provides monitoring of 260 modules on a 1,024 × 768 pixel screen without scrolling. It displays a status summary for each module, with additional status information for Lab.gruppen amplifiers. More pages can be added as required to logically partition your system.

For further details, please refer to Section 7.7.

3.2.4 Minimizing the Lake Controller

To minimize the Dolby Lake Controller software and return to Windows, tap the Lake icon in the top-right corner of any screen.

This icon is animated. It rotates when the software is performing any function that requires the user to wait for data to be transferred or loaded.

3.3 Modules and Frames

3.3.1 Overview

A frame represents one physical Dolby Lake Processor on the network (or another product that contains Lake Contour™/Mesa EQ™ functionality). Multiple modules are contained within each frame. The number of modules shown in a given frame is dependent upon the signal processing configuration/capabilities for the frame.

The Dolby Lake Processor provides three different signal processing configurations.

Table 3-1 Dolby Lake Processor Signal Processing Configurations

Configuration Mode	Description	
Contour	4 × 12 loudspeaker processor	
Mesa	8 × 8 system equalizer	
Contour & Mesa	2 × 6 loudspeaker processor	4 × 4 system equalizer

You can choose any one of these modes when configuring the Dolby Lake Processor, and each mode provides a different number of modules.

Table 3-2 Number of Modules in Different Processor Configurations

Configuration	Number of Modules
Contour Loudspeaker Processor	Four Contour
Mesa System Equalizer	Eight Mesa
Contour & Mesa	Two Contour and four Mesa

Figure 3-1 Contour Frame

Figure 3-2 Mesa Frame

Figure 3-3 Contour & Mesa Frame

For this tutorial, we configure the Processor to operate in Contour & Mesa mode, so we can see both types of modules on the same frame.

3.3.2 Changing to Contour & Mesa Mode

From the **Main** page, tap **Modules**. The module scroll bar will appear with either four Contour modules or eight Mesa EQ modules. The default factory reset state depends on the analog card configuration of your Dolby Lake Processor.

The following example shows four Contour modules:

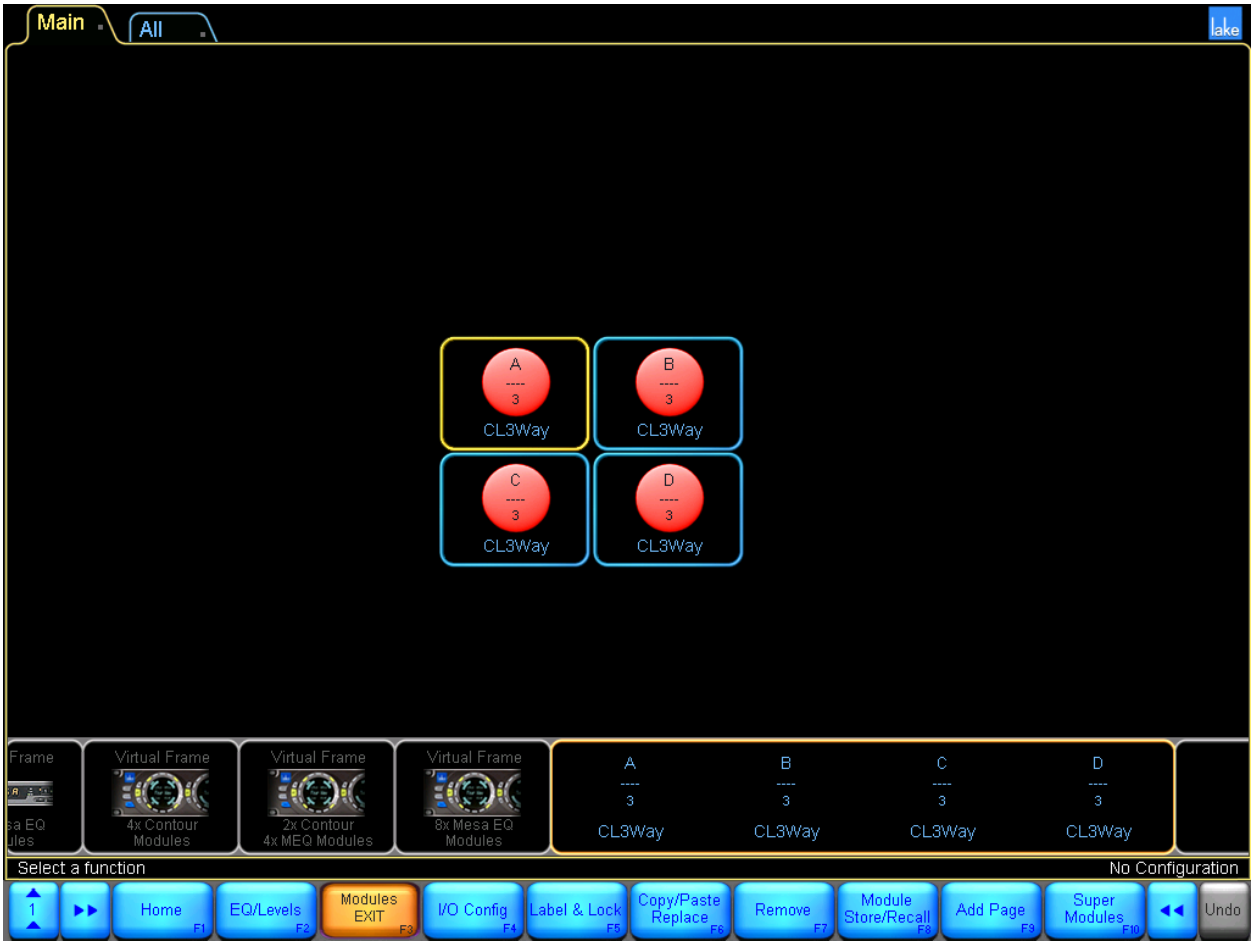
With one Processor on the network configured as a loudspeaker processor, the module scroll bar displays virtual frame icons and four Contour modules.

Note: A virtual frame is always accessible whether or not the Dolby Lake Controller is connected to a network of Processors. Virtual frames allow offline adjustment of module parameters, which enables entire systems to be designed offline. Virtual frames can be replaced with online frames once you are connected to a system network.

We now need to place the Contour modules on the **Main** page to enable adjustment:

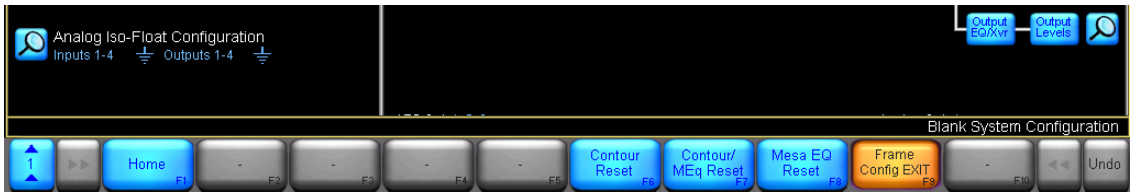
1. In the scroll bar, tap module **A** once. All four module icons move out of the scroll bar with your mouse or stylus.

2. Tap the **Main** page where you wish to place the modules of the selected frame.



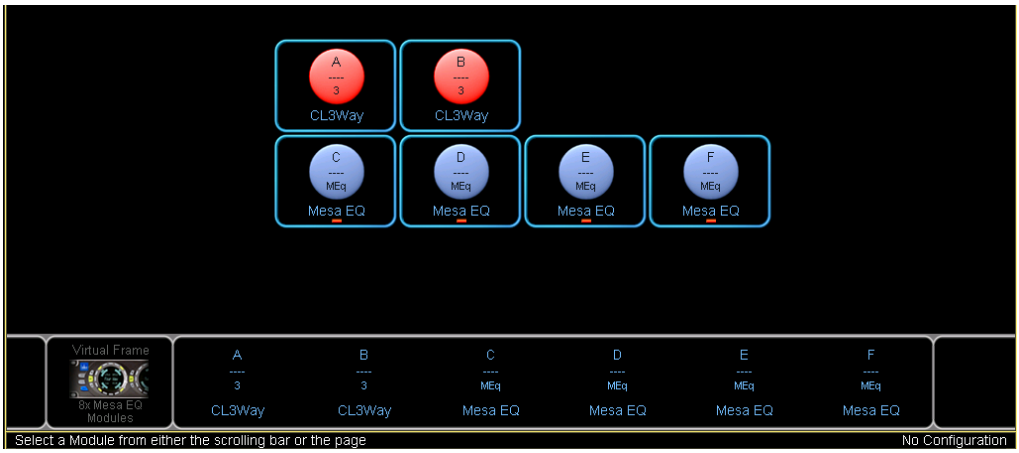
The Processor hardware now synchronizes with the Controller. During the synchronization process, the Controller gathers all of the current settings of the hardware Processor.

3. Once the Processor is synchronized with the Controller, tap the **I/O Config** button to bring up the **I/O Config** page. This view shows the block diagram of the current signal processing configuration of the Processor.
4. Tap the **Frame Config** button, and then tap the **Contour/MEq Reset** button.



Following the reset, the module icons are returned to the scroll bar, with six modules now displayed—two Contour modules and four Mesa EQ modules.

5. Repeat the same sequence, tapping a module in the scroll bar and placing the modules on the **Main** page.



Now that all the module icons are on the **Main** page, we can begin adjusting each module's parameters. Before making such further adjustments, let's review the information displayed by the module icons.

3.3.3 Module Icons

Each module icon provides configuration information as shown in Figure 3-4.

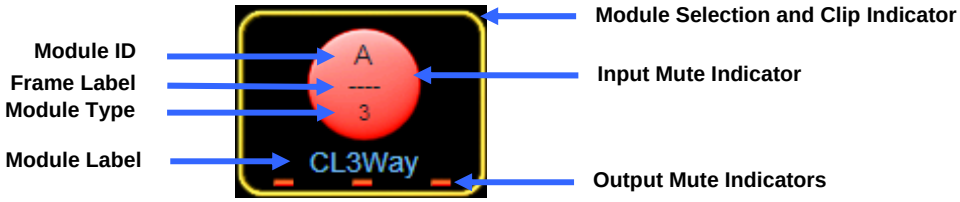


Figure 3-4 Module Components

- **Module ID**—Identifies the module designator of the Processor represented by this icon.
- **Frame label**—Identifies the frame associated with this icon by a user-defined label that also appears on the Processor.
- **Module type**—Identifies the number of output channels or an abbreviation of a module type description (MEq for a Mesa EQ module).
- **Module label**—A user-defined label that describes the module's use or speaker type.

- **Module selection and clip indicator**—The module icon border is yellow to indicate the module is selected. If it flashes red, a channel on that module is clipping.
- **Input mute indicator**—If the central round part of the icon is red, the input is muted; if the icon is blue, the input is not muted.
- **Output mute indicators**—Display as small red bars when the outputs are muted and are absent if unmuted. The number of mute indicators depends on the number of output channels in the selected module type.

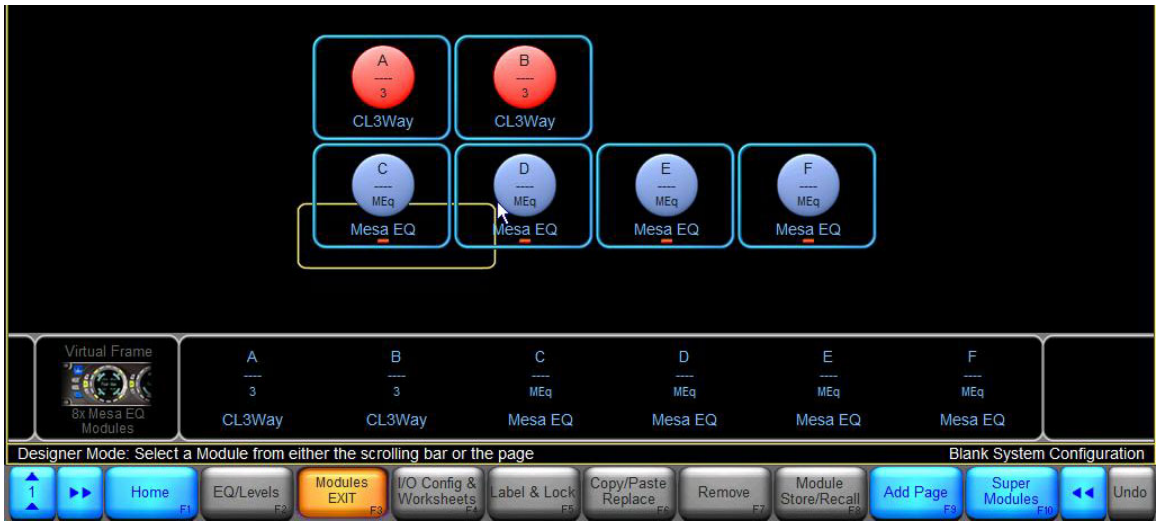
The default configuration for a Contour module is a set of 24 dB-per-octave Linkwitz-Riley three-way crossovers with frequencies centered at 250 and 1,600 Hz. The default module label is CL3way, which is an abbreviation for Classic 3-Way configuration.

The default configuration for a Mesa EQ module is a flat frequency response without any EQ filters inserted. The default module label is **Mesa EQ**.

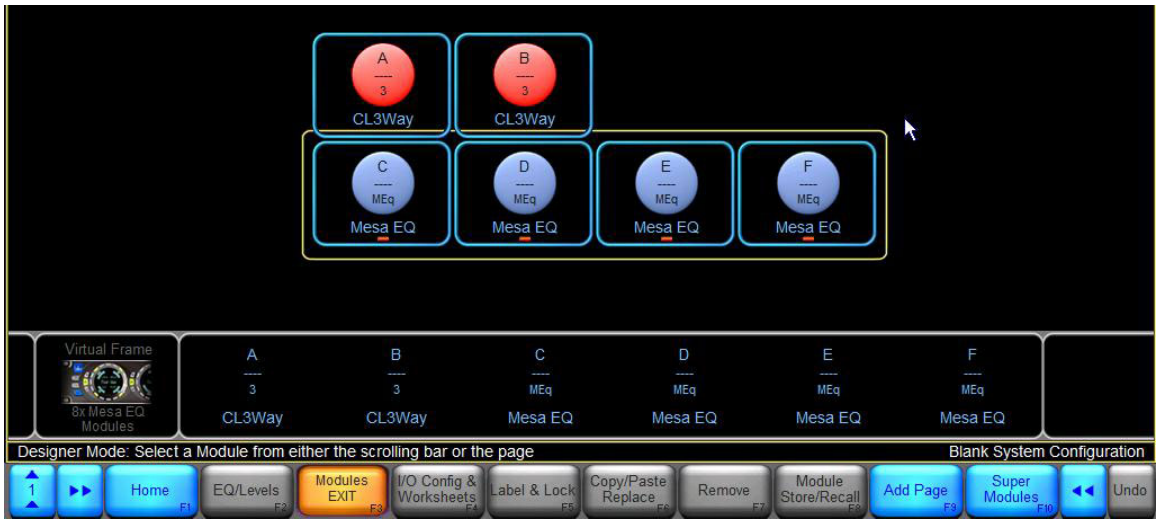
3.3.4 Selecting and Moving Icons

Multiple icons may be selected (via the **Modules**, **Groups**, **Pages**, and **Icon Control** menus), providing a faster solution to graphical arrangement of the work area.

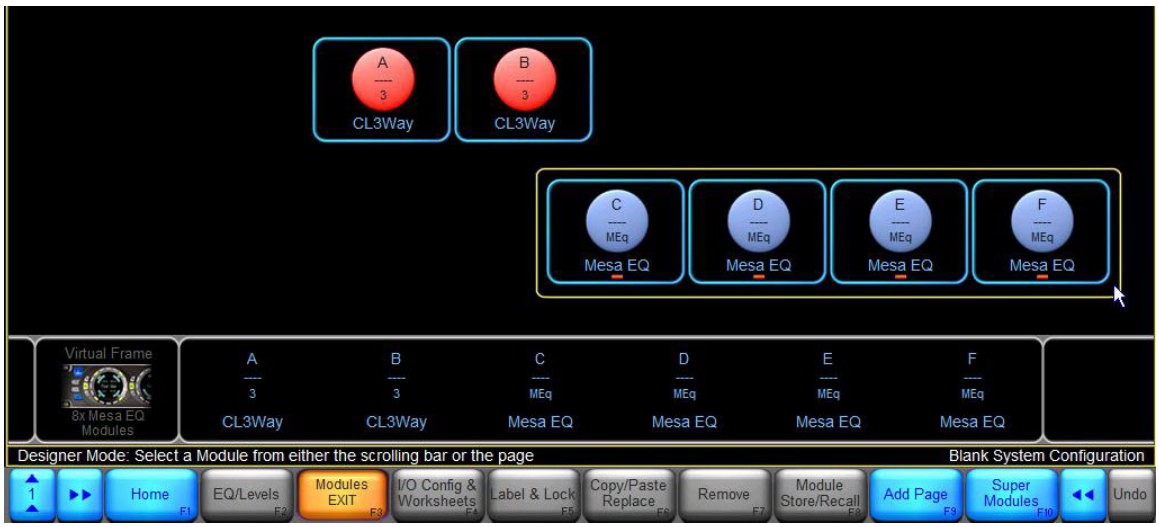
For example, multiple icons can be dragged back to the scroll bar, moved, or copied to another page tab.



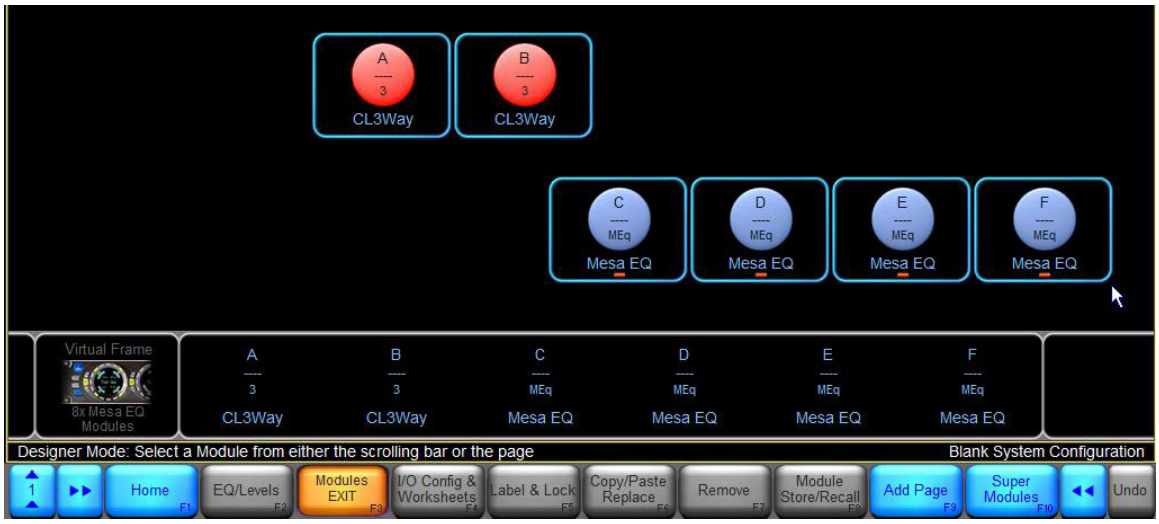
1. Drag a box around the icons you wish to move.



2. Release the pen (or mouse); icons inside the yellow rectangle are now selected.



3. Tap inside the yellow box, and drag it to the new area.



4. Release the pen; the icons are now deselected.

To drag icons to a new page, select the icons you wish to move and then drag them over the page's tab at the top. That page will be automatically selected. You may then place the icons where required.

3.3.5 Labeling Frames and Modules

The frame label is initially blank (**----**) in the Dolby Lake Controller module icon and on the front panel of the Dolby Lake Processor. The frame label is most helpful in identifying the physical location of a Processor in a distributed network of hardware processors.

To name the frame:

1. Tap the **A** module to select it. A yellow border surrounding the module icon indicates it is selected.

Note: If a module is not selected, most of the button-bar functions are gray to signify they are inactive.

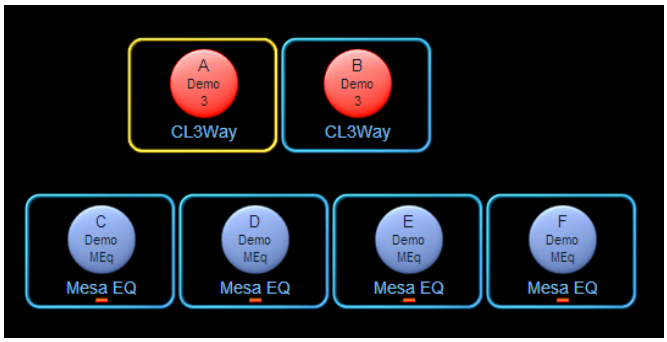
2. Tap **Label & Lock**.

3. Tap **Label Frame** to display the onscreen keyboard.

Enter label for Contour Frame (4 chars. max.) - OK to finish
1 2 3 4 5 6 7 8 9 0 Backspace
q w e r t y u i o p OK
Caps a s d f g h j k l -
Ctrl z x c v b n m . Space Cancel

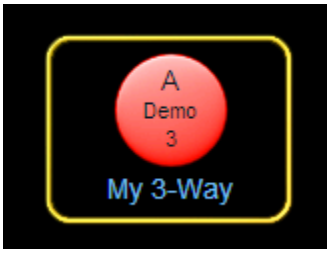
4. Type *Demo* using the onscreen keyboard (or an external keyboard, if available), and tap **OK**.

The frame label field for the frame's modules displays **Demo** in the software.



Now let's assign a name to the **A** module:

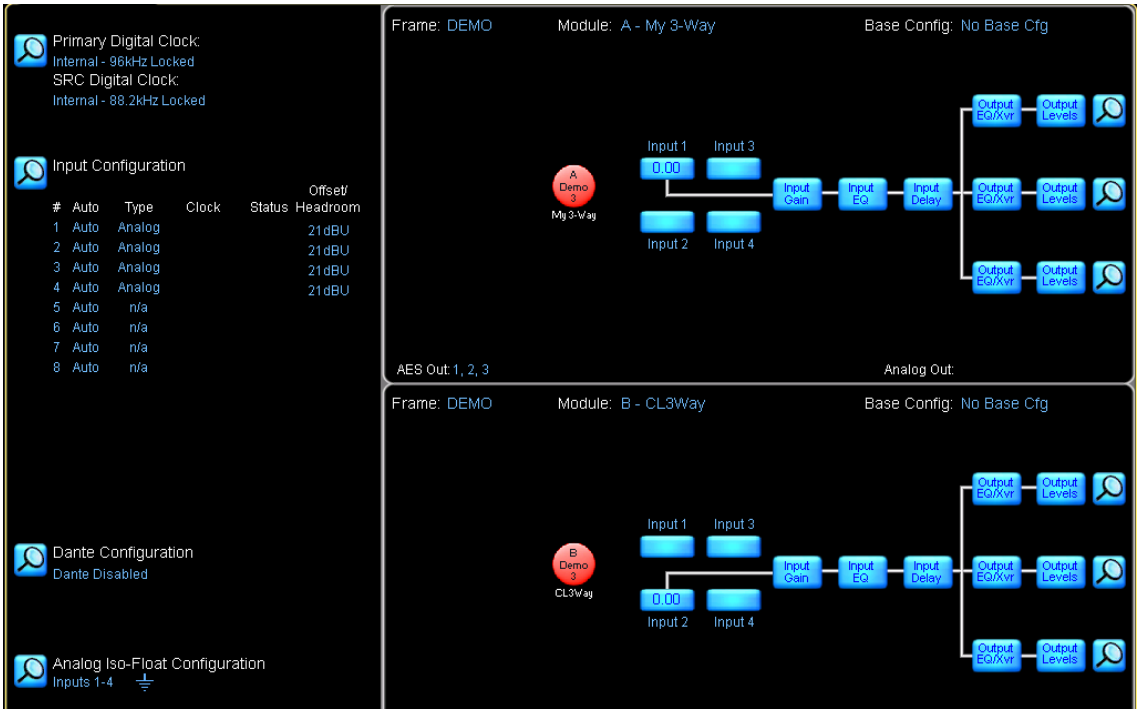
1. Tap the **A** module to select it.
2. Select **Label Module** from the button bar.
3. Name this module *My 3-Way* using the onscreen keyboard, and tap **OK**.
4. Tap **Label Exit** to return to the **Modules** menu.



Note: To label a Super Module, select it in the work area and tap **Label SuperMod.**

3.3.6 I/O Config

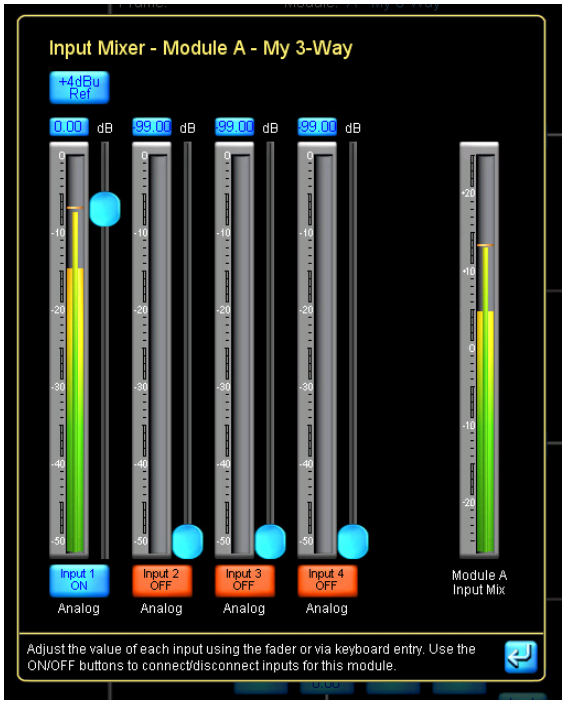
1. Tap the **I/O Config** button to display the block diagrams of each module in the frame.



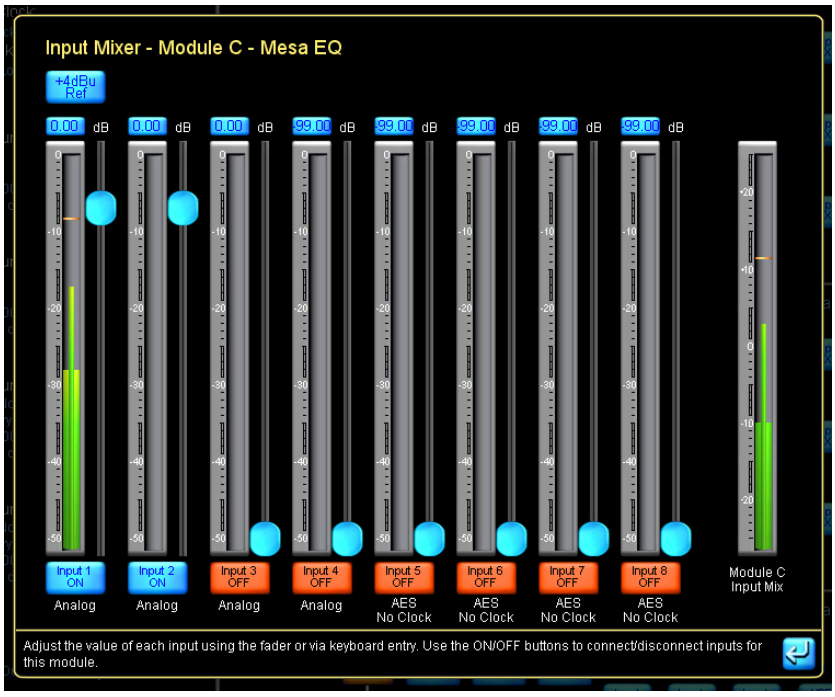
The right side of the **I/O Config** page scrolls up and down to view all module block diagrams.

2. Tap any black space within the block diagram area and drag up or down to scroll. As you scroll down, you can see the Mesa EQ block diagrams as well. The I/O Config page is interactive; each blue processing block can be selected to directly access the relevant screen in the software. Each block diagram has a front-end input mixer.

3. Tap any one of the four inputs of the My 3-Way module to access the input mixer.

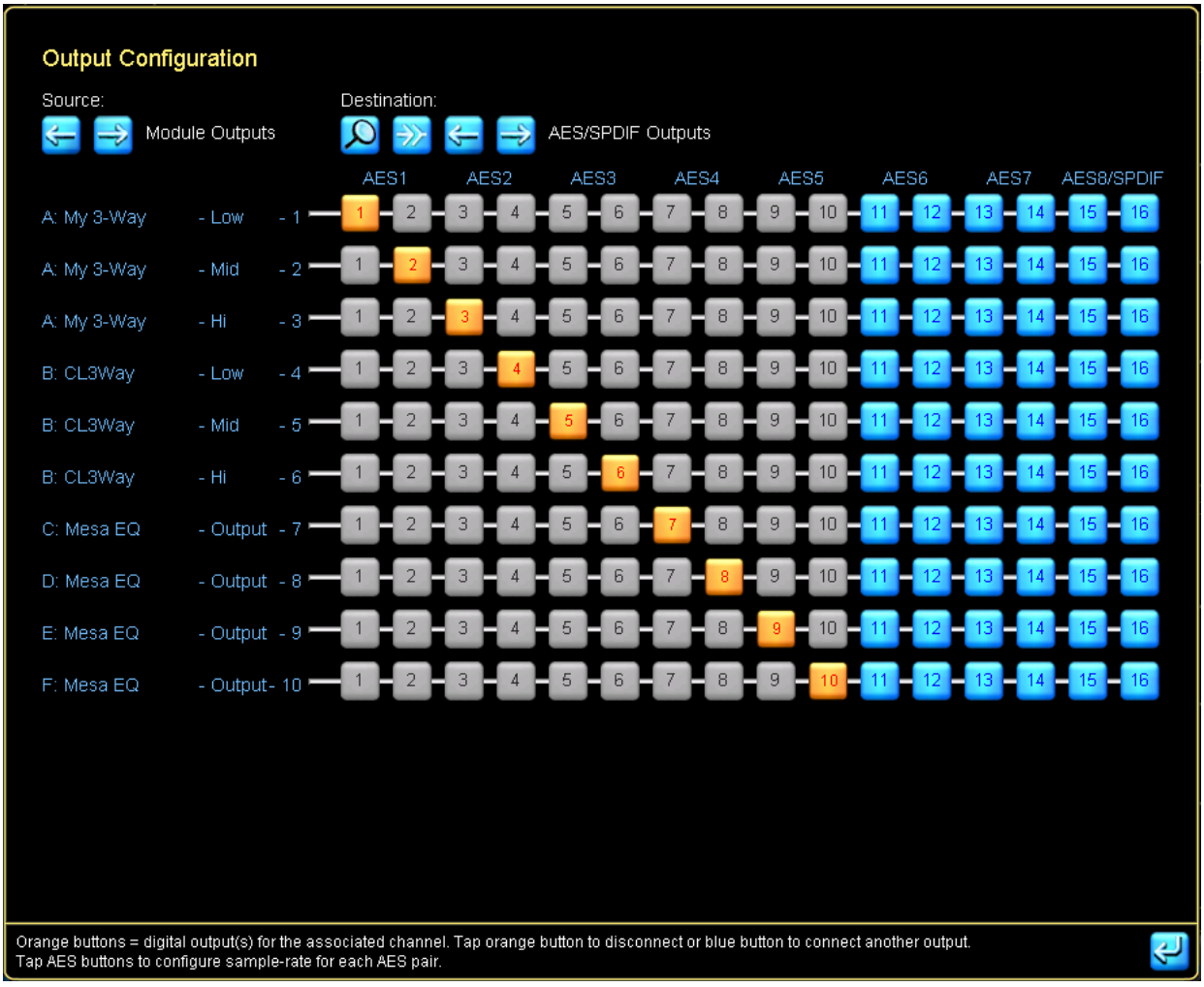


Loudspeaker processor modules have a fully functional four-input mixer that allows you to combine any of the four inputs as required for your particular application. Mesa EQ modules have an eight-input mixer for combining inputs.



4. Tap the exit button in the bottom-right corner of the **Input Mixer** pop-up window to return to the **I/O Config** screen.

Each output can be custom configured by the user as well. Tap one of the zoom icons (represented by a magnifying glass) on the right side of the module's block diagram. This action will open the **Output Configuration** window.

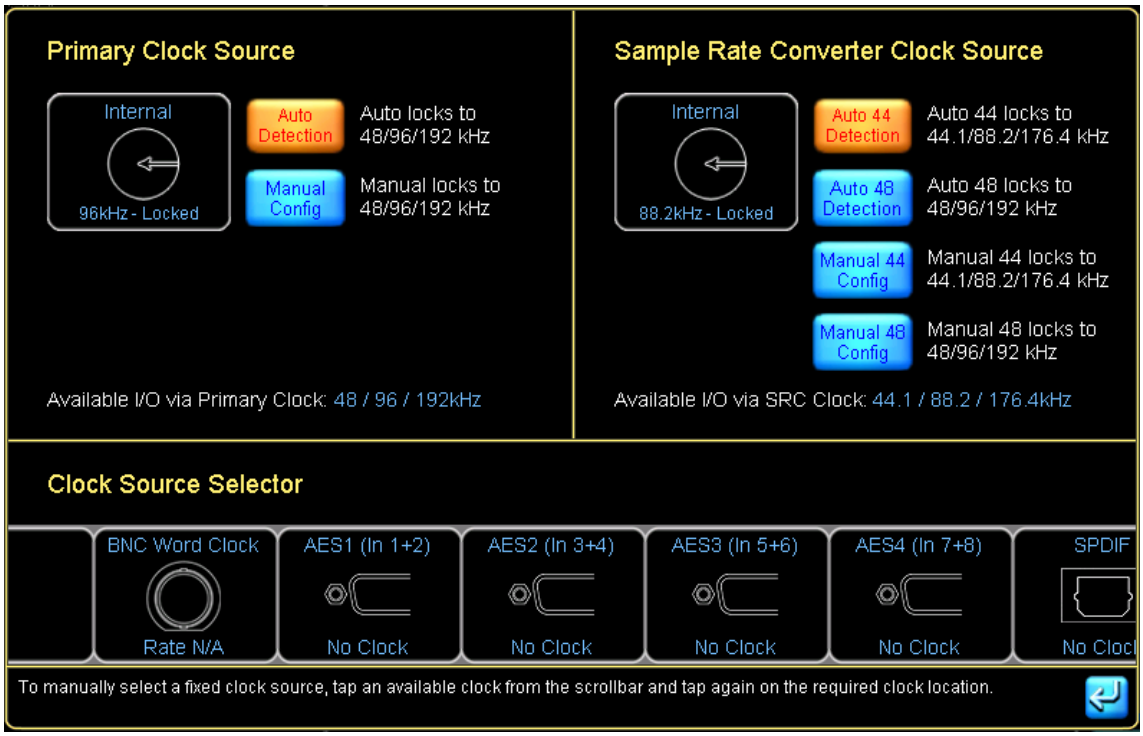

Output Configuration
Source:
Module Outputs
Destination:
AES/SPDIF Outputs
AES1 AES2 AES3 AES4 AES5 AES6 AES7 AES8/SPDIF
A: My 3-Way - Low - 1
A: My 3-Way - Mid - 2
A: My 3-Way - Hi - 3
B: CL3Way - Low - 4
B: CL3Way - Mid - 5
B: CL3Way - Hi - 6
C: Mesa EQ - Output - 7
D: Mesa EQ - Output - 8
E: Mesa EQ - Output - 9
F: Mesa EQ - Output - 10
Orange buttons = digital output(s) for the associated channel. Tap orange button to disconnect or blue button to connect another output.
Tap AES buttons to configure sample-rate for each AES pair.

The **Output Configuration** window provides the ability to route any physical input or module output to any available analog or digital output on the Dolby Lake Processor. The arrows below the source and destination labels allow selection and mapping of all available I/O.

5. Tap on the exit button in the bottom right to return to the **I/O Config** page.

The left side of the **I/O Config** page provides both clock and input configuration functions. Status information is provided, and zoom icons open pop-up windows for access to configuration parameters.

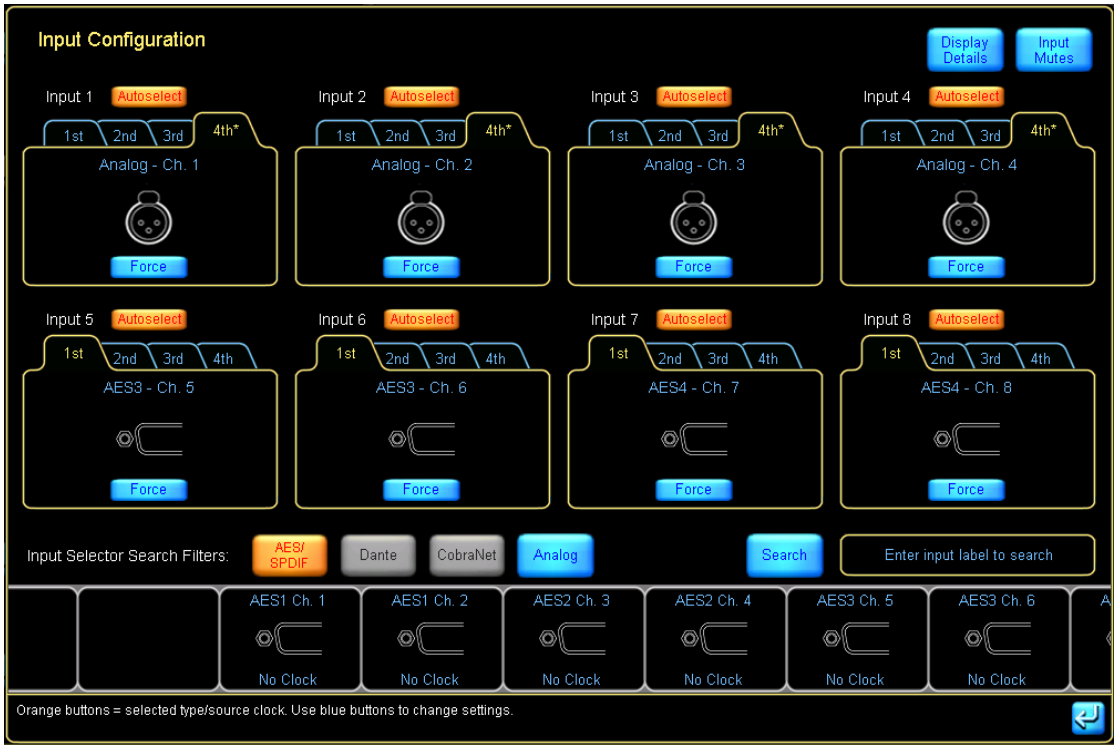
The Processor has a sophisticated clock system, allowing you to select between internal and external clock sources at all standard audio sample rates. By default, the Processor uses its internal clock operating at 96 kHz. You can choose to use any available external clock source using the interface provided by the clock source configuration window.


Primary Clock Source
Internal
96kHz - Locked
Auto Detection
Auto locks to 48/96/192 kHz
Manual Config
Manual locks to 48/96/192 kHz
Available I/O via Primary Clock: 48 / 96 / 192kHz
Sample Rate Converter Clock Source
Internal
88.2kHz - Locked
Auto 44 Detection
Auto 44 locks to 44.1/88.2/176.4 kHz
Auto 48 Detection
Auto 48 locks to 48/96/192 kHz
Manual 44 Config
Manual 44 locks to 44.1/88.2/176.4 kHz
Manual 48 Config
Manual 48 locks to 48/96/192 kHz
Available I/O via SRC Clock: 44.1 / 88.2 / 176.4kHz
Clock Source Selector
BNC Word Clock
Rate N/A
AES1 (In 1+2)
No Clock
AES2 (In 3+4)
No Clock
AES3 (In 5+6)
No Clock
AES4 (In 7+8)
No Clock
SPDIF
No Clock
To manually select a fixed clock source, tap an available clock from the scrollbar and tap again on the required clock location.

The current Primary Clock Source is shown on the top left of the screen, and the current Sample Rate Converter Clock Source is shown on the top right. You can choose any available clock source using the Clock Source Selector scroll bar at the bottom of this window.

Please refer to the *Dolby Lake Processor System Manual* for further details on clocks, clock source priorities, sample-rate converters, and signal processing latency.

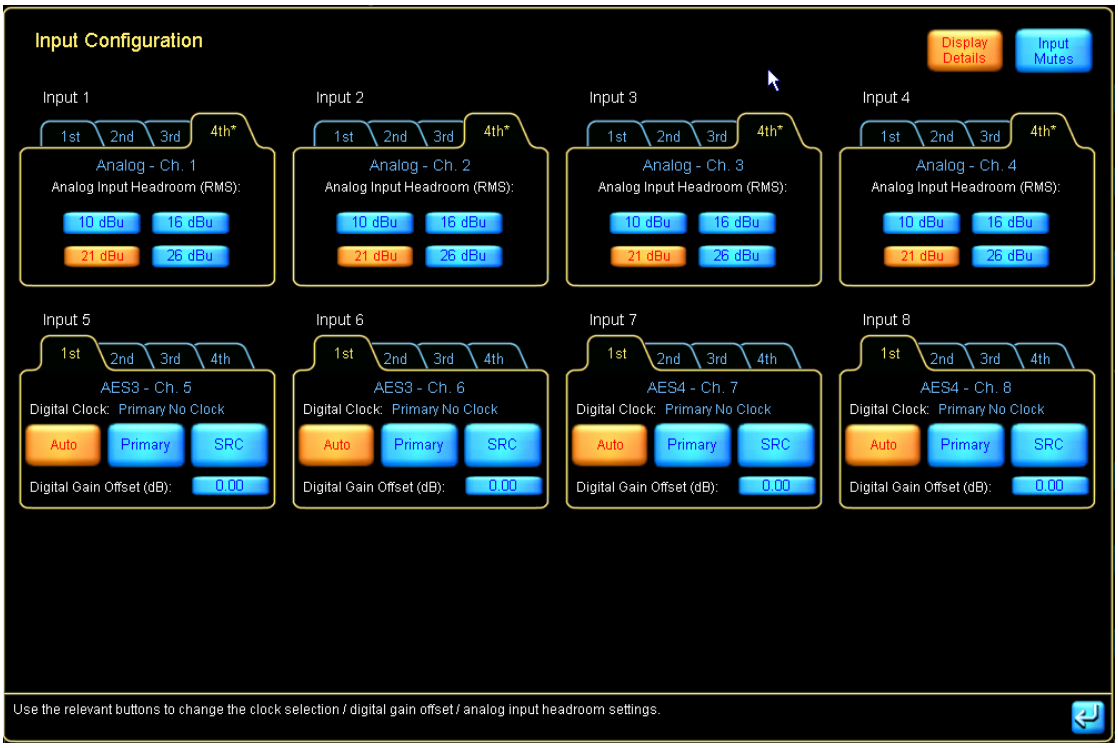
The input configuration pop-out window allows flexible routing of all available inputs to each Input Mixer channel along with a four-level auto-select priority allocation for each input, as shown in the following screenshot.



From this interface, you can allocate which input is used for each input channel of the Input Mixer, and in which order up to four inputs should auto-select (failover) for each input channel.

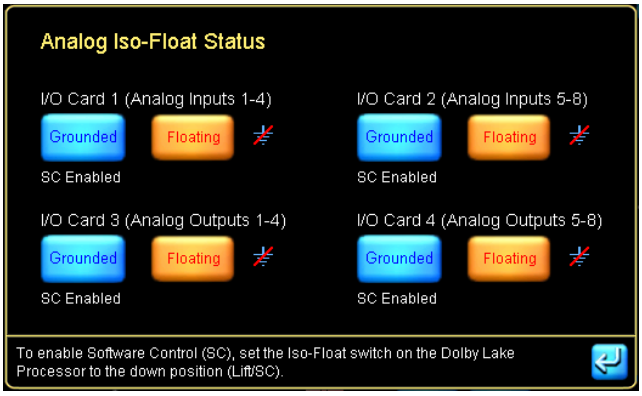
The input **Autoselect** feature allows you to set up a redundant system. The Processor will attempt to use the first signal. If the first signal is unavailable, it will try the second, third, and fourth signals.

Tapping **Display Details** allows control of digital clock selection/digital gain offsets and analog input headroom:



The **Gain Offset** feature allows you to fine-tune the gain between different digital and analog signals to allow for a seamless transition between the signal sources.

The last item on the left side of the **I/O Config** page allows you to remotely control Iso-Float™. This powerful feature allows you to troubleshoot grounding issues remotely from the Controller.


Analog Iso-Float Status
I/O Card 1 (Analog Inputs 1-4)
Grounded Floating
SC Enabled
I/O Card 2 (Analog Inputs 5-8)
Grounded Floating
SC Enabled
I/O Card 3 (Analog Outputs 1-4)
Grounded Floating
SC Enabled
I/O Card 4 (Analog Outputs 5-8)
Grounded Floating
SC Enabled
To enable Software Control (SC), set the Iso-Float switch on the Dolby Lake Processor to the down position (Lift/SC).

The **Analog Iso-Float Status** window shows you the current state of the Processor hardware and allows you to make changes to the grounding state of each analog converter card when the software control function has been enabled.

After closing the **Analog Iso-Float Status** pop-up window, return to the **Main** page by tapping the **Home** button.

Note: CobraNet® functions are available only when a CobraNet card is installed.

3.3.7 Dante

Dante audio networking technology from Audinate provides a hassle free digital audio networking solution for the Dolby Lake Processor with extremely reliable, sample-accurate, low-latency audio distribution over Ethernet.

Dante provides a reliable, digital-audio networking system with complete flexibility, ease of use, and cost-effectiveness. With innovative features such as Zen, Dante-enabled Dolby Lake Processors automatically find each other and provide the ability for any Dante audio channel on the network to be routed to the input of one or more processors.

Dante can be easily integrated into an existing network, sharing the system with normal data traffic. And, if you want to do digital audio recording, processing, or playback using computer-based programs, the Dante virtual soundcard enables you to just plug the network directly into the standard Ethernet port on a PC—no external boxes or soundcards are required.

Dante is built into the Dolby Lake Processor. No additional hardware is required. The Dolby Lake Processor supports up to 8 Dante audio inputs and 16 Dante audio outputs over a single Ethernet connection.

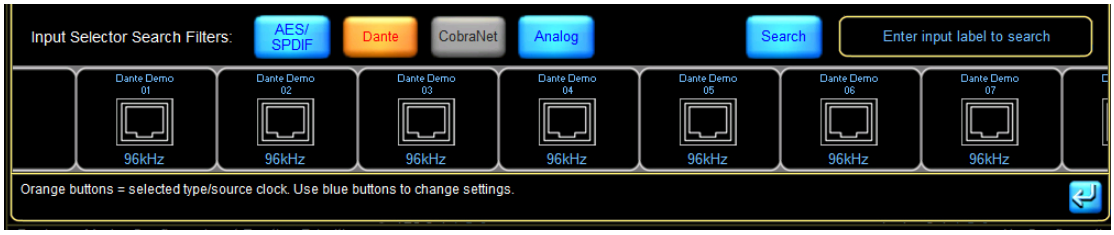
Tapping the zoom button labeled **Dante Configuration** displays the following screen, with Dante disabled by default:

Dante Configuration
Dante Disabled
Transmit Outputs
Minimum Latency
0.8 ms
1.3 ms
4.0 ms
Output Channel Labels
Auto Multi Uni Out1: 01
Auto Multi Uni Out2: 02
Auto Multi Uni Out3: 03
Auto Multi Uni Out4: 04
Auto Multi Uni Out5: 05
Auto Multi Uni Out6: 06
Auto Multi Uni Out7: 07
Auto Multi Uni Out8: 08
Auto Multi Uni Out9: 09
Auto Multi Uni Out10: 10
Auto Multi Uni Out11: 11
Auto Multi Uni Out12: 12
Auto Multi Uni Out13: 13
Auto Multi Uni Out14: 14
Auto Multi Uni Out15: 15
Auto Multi Uni Out16: 16
NOTE: When Dante is enabled, ensure the SRC Clock is used to lock any additional digital signal to this processor.

When Dante is enabled, by default the processor will only receive audio. Transmission is disabled in order to prevent clutter in the input configuration screen. If you wish to transmit Dante channels from this processor, enable by clicking on the Transmit Outputs button. Transmit channels from this processor appear on the list of all available Dante channels on the network.

Dante Configuration
Dante Enabled
Transmit Outputs
Master for Dante Network
Receive Enabled / Transmit Disabled
Minimum Latency
0.8 ms
1.3 ms
4.0 ms
Output Channel Labels
Auto Multi Uni Out1: 01
Auto Multi Uni Out2: 02
Auto Multi Uni Out3: 03
Auto Multi Uni Out4: 04
Auto Multi Uni Out5: 05
Auto Multi Uni Out6: 06
Auto Multi Uni Out7: 07
Auto Multi Uni Out8: 08
Auto Multi Uni Out9: 09
Auto Multi Uni Out10: 10
Auto Multi Uni Out11: 11
Auto Multi Uni Out12: 12
Auto Multi Uni Out13: 13
Auto Multi Uni Out14: 14
Auto Multi Uni Out15: 15
Auto Multi Uni Out16: 16
NOTE: When Dante is enabled, ensure the SRC Clock is used to lock any additional digital signal to this processor.

When Dante is enabled, the Input Configuration page for the selected processor provides an option to view available Dante channels on the network. Any of these channels can be selected as the inputs for the processor:



Minimum Latency Options

This latency is additional Dante-specific latency used to ensure uninterrupted digital audio. The latency is added to the normal latency of your chosen signal path and module type.

The 0.8 (default), 1.3, and 4 ms minimum receive latency options are provided to allow flexibility for complex networks, or when using switches without QoS (Quality of Service). Higher latency reduces the chance of audio glitches due to audio packets being delayed via the network, therefore is recommended for complex networks containing many hops, or in circumstances where a small delay irrelevant and reliability is paramount.

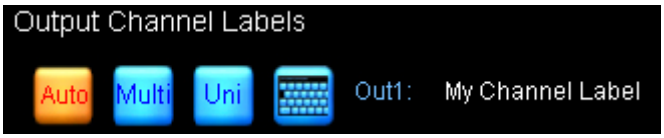
Using switches without QoS is not recommended. If this is the case, then the 4 ms latency option should be used to minimize the change of audio glitches due to audio packets being delayed due to being queued behind data packets.

Transmit Outputs/Dante Output Channel Settings

When the **Transmit Outputs** button is active (orange), all 16 Dante channels will be advertised on the Dante audio network as available channels for any other Dante receiver to use for its input(s). In addition, this screen provides Auto/Unicast/Multicast options for each channel, and output channel labeling functions:

Dante Configuration
Dante Enabled
Transmit Outputs
Master for Dante Network
Receive Enabled / Transmit Enabled
Minimum Latency
0.8 ms
1.3 ms
4.0 ms
Output Channel Labels
Auto Multi Uni Out1: 01
Auto Multi Uni Out2: 02
Auto Multi Uni Out3: 03
Auto Multi Uni Out4: 04
Auto Multi Uni Out5: 05
Auto Multi Uni Out6: 06
Auto Multi Uni Out7: 07
Auto Multi Uni Out8: 08
Auto Multi Uni Out9: 09
Auto Multi Uni Out10: 10
Auto Multi Uni Out11: 11
Auto Multi Uni Out12: 12
Auto Multi Uni Out13: 13
Auto Multi Uni Out14: 14
Auto Multi Uni Out15: 15
Auto Multi Uni Out16: 16
NOTE: When Dante is enabled, ensure the SRC Clock is used to lock any additional digital signal to this processor.

Dante Output Channel Functions



The Auto/Multi/Uni options provide the ability, per channel, to set whether that channel is going to be forced as unicast (each receiver will get a separate point-to-point audio flow), forced as multicast (many receivers can listen to the same multicast flow sent by the transmitter), or automatically controlled by the Dante network (unicast or multicast will be selected based on the number of receivers for this channel). This advanced setting can generally be left as **Auto.**

Tapping the keyboard button to the right of the **Uni** button will display the onscreen keyboard allowing up to a 31-character name to be entered for this Dante channel. On the input configuration of other processors, the Frame label along with this label (or channel number if no label is defined) will be used to uniquely identify the available Dante channels on the network.

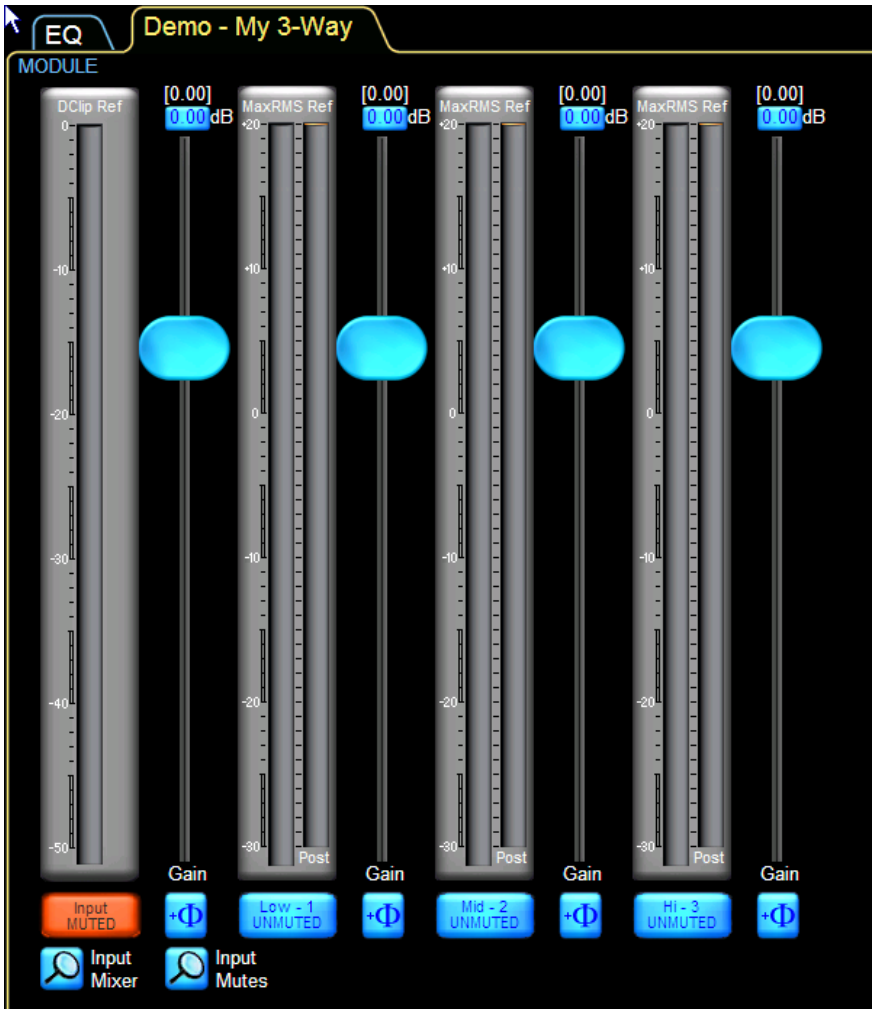
Using meaningful channel labels is recommended before configuring your system routing to ensure error-free routing.

3.3.8 Levels and Meters

From the **Main** page, tap the **My 3-Way** module icon to display its parameters. This action will enter the EQ and Levels interface for the module, displaying the **EQ** screen the first time it is accessed.

Tap the **Levels** tab at the top left of the display to access the **Levels** interface. This provides metering information and faders for adjustment of gains, delays, and limiters.

By default, gain controls and meters are displayed for the input and all outputs of the module. Mute controls are located below each input and output meter, with a polarity button for the input.



To unmute the module input, tap the red mute button labeled **Input MUTED.**

Note: The module Input Mute button mutes or unmutes the post input mixer signal. If you would like to make adjustments to the levels of each physical input to the hardware processor, tap the **Input Mixer** button below the module **Input Muted** button.

Adjusting Levels

There are three ways to adjust the gain of an input or output:

- Make large changes (1 dB increments) by tapping and sliding the fader.
- Make small adjustments (0.1 dB increments) by tapping and dragging above, below, or to the left of each fader control.
- Adjust the gain to an exact value (0.01 dB increments) by tapping the gain value directly and using the onscreen keyboard to enter the new value as follows:
  1. Tap the input gain value (highlighted in blue at the top left of the screen).
  2. Enter –3.75 dB of gain, and tap **OK**.

The same principles apply to adjusting other levels (delays, limiters, and so on) throughout the Dolby Lake Controller software.

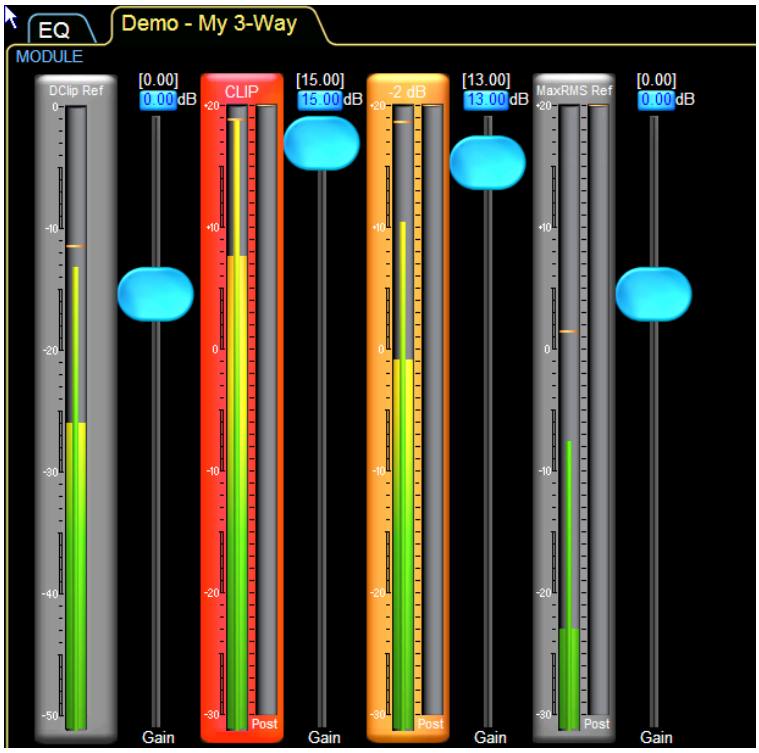
To view/update other types of levels, simply tap the required type of level from the button bar (**Delay**, **Limiter Max RMS**, and so on). The faders and levels change to display the value of the selected level type.

Metering

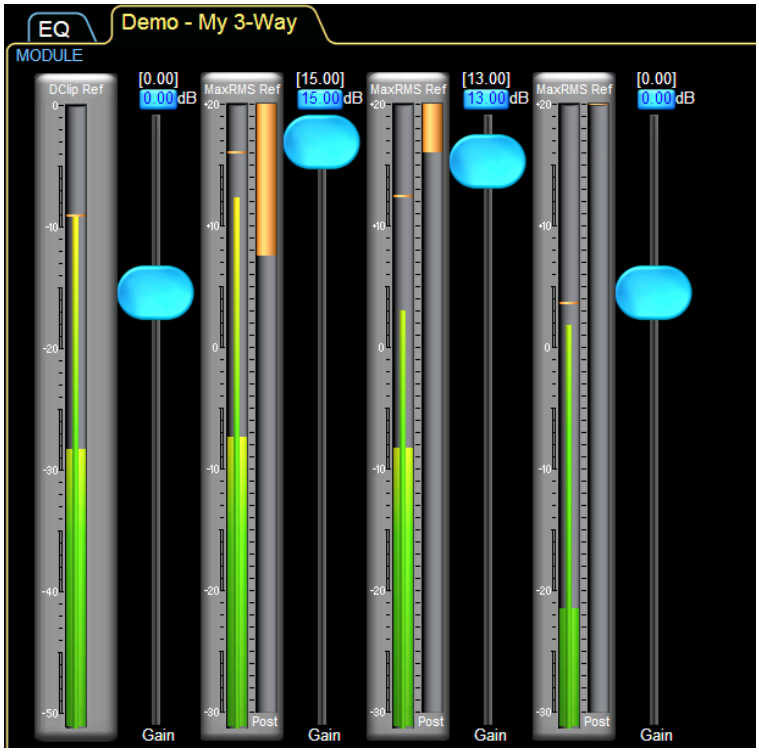
In the Levels interface, all input and output levels are accompanied by metering. Input meters show both average level and peak level, with a user-definable peak hold. Output meters show the aforementioned level metering on the left side of the meter face, and additionally show limiter activity on the right side of the meter face.

Note: Regardless of what level control you are currently adjusting, gain and limiter meters always display.

If an audio channel is clipped, the meter face turns red. Additionally, if an audio channel is within 2 dB of clipping, the meter face turns orange.



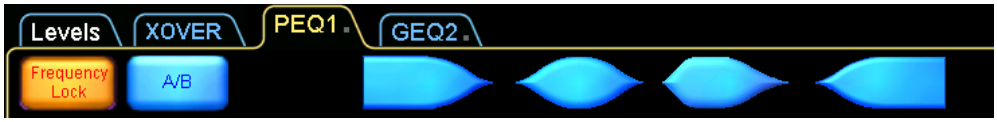
As limiters are engaged, the amount of gain reduction is shown with a meter operating in the downward direction.



The limiter meter displays the total amount of limiting resulting from both peak and RMS limiter functions of the LimiterMax™ loudspeaker protection system.

3.4 Equalization

From the **Levels** interface, tap the **EQ** tab in the top-left corner of the display to move to the EQ controls for the module. Parametric EQ (**PEQ**) is displayed by default.

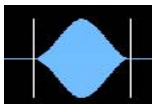


Multiple EQ overlays are identified by tabs at the top left of the display. A three-way module initially has one parametric (**PEQ1**) and one graphic (**GEQ2**) overlay, in addition to the **Xover** tab. A Mesa EQ module has a tab labeled **HPF/LPF** instead of **Xover**.

The parametric overlay (PEQ) provides low-shelf, parametric, Mesa, and high-shelf filters. The graphic overlay (GEQ) provides third-octave EQ controls. The **Xover** screen allows selection and adjustment of crossover filters, in addition to output EQ.

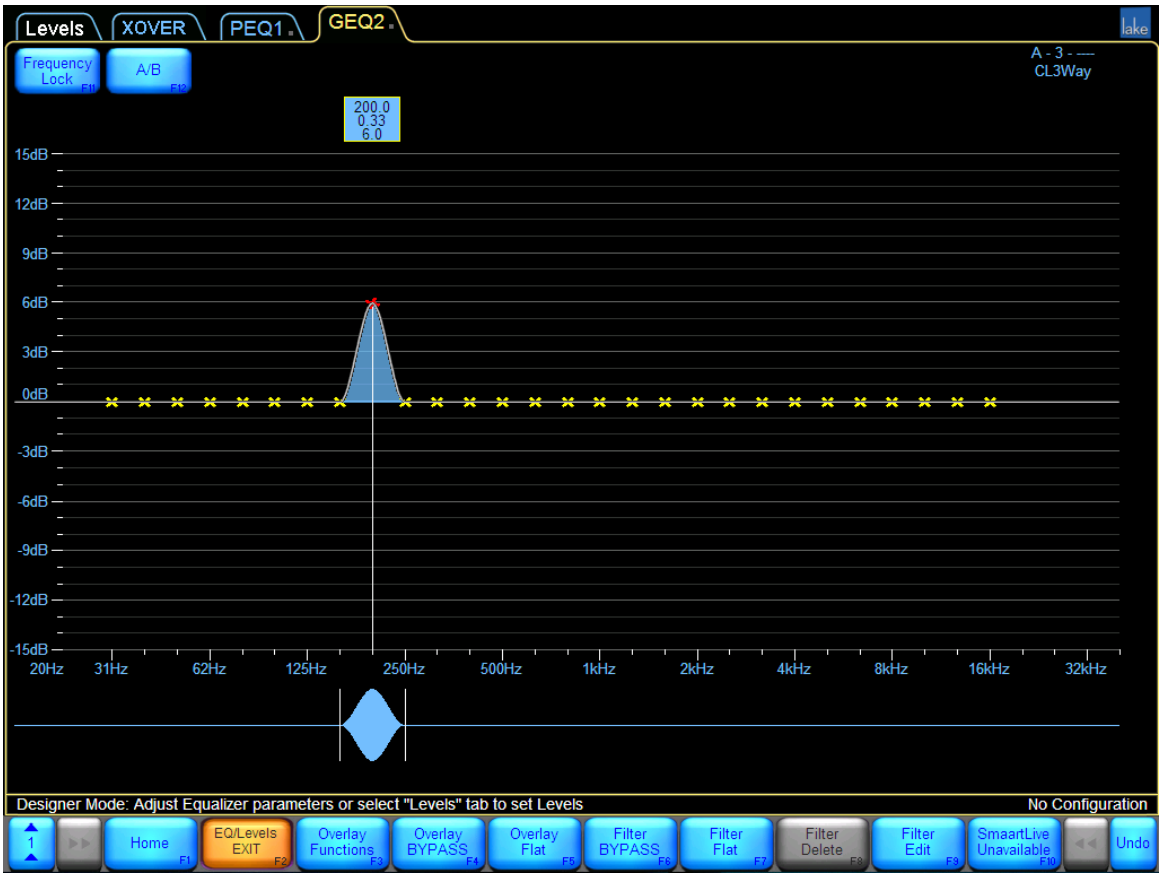
3.4.1 Graphic EQ

1. Tap the **GEQ2** overlay to access the default third-octave graphic overlay. The bottom section of the graphic EQ screen contains the EQ Tool, which is used to select a frequency band for gain adjustment.



2. To select a frequency band, tap and drag the selector left or right. To adjust gain of the selected filter, tap the red rotating **X** and slide up to boost or down to cut.

Note: If Frequency Lock is off (blue), the frequency can also be selected and changed by directly tapping and dragging a yellow **X** filter point on the EQ interface.



3. Tap **Filter Flat** on the button bar to flatten the selected filter.

Many other features are available on the **EQ** button bar; please refer to Chapter 5 for further details.

3.4.2 Ideal Graphic EQ

A unique innovation found within the Dolby Lake Processor, Contour, and Mesa EQ processors is the Ideal Graphic EQ™. Conventional analog and digital graphic equalizers do not provide intuitive results. For example, pulling up the faders on a conventional graphic equalizer to boost 6 dB at 500; 630; 800; 1,000; 1,250; 1,600; and 2,000 Hz produces the frequency response shown in Figure 3-5.

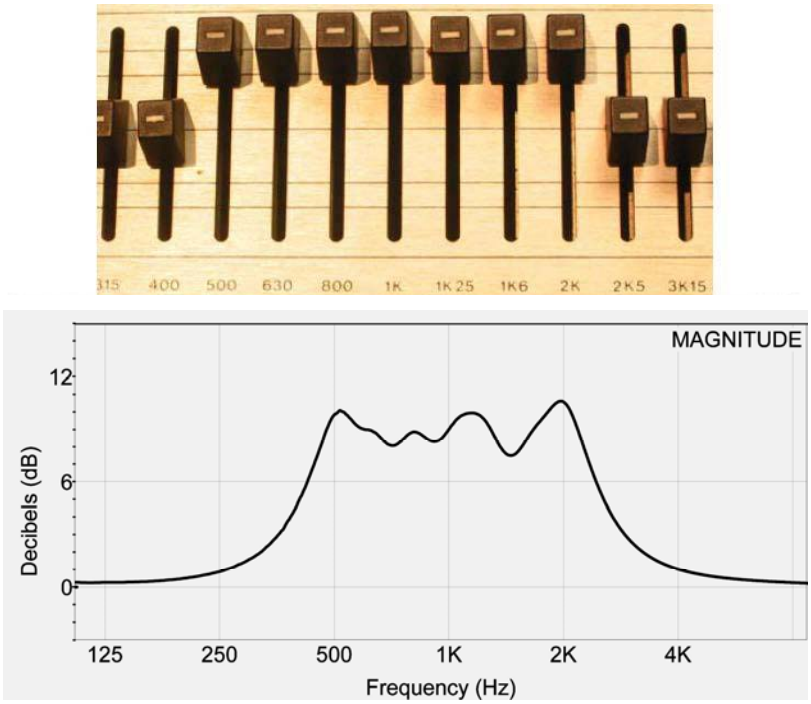


Figure 3-5 Conventional Graphic Equalization and Resulting Frequency Response

This measured frequency response is not what you would expect from the graphic EQ controls.

If we use the GEQ overlay to boost 6 dB at 500; 630; 800; 1,000; 1,250; 1,600; and 2,000 Hz, the frequency response is shown by the blue trace in Figure 3-6.

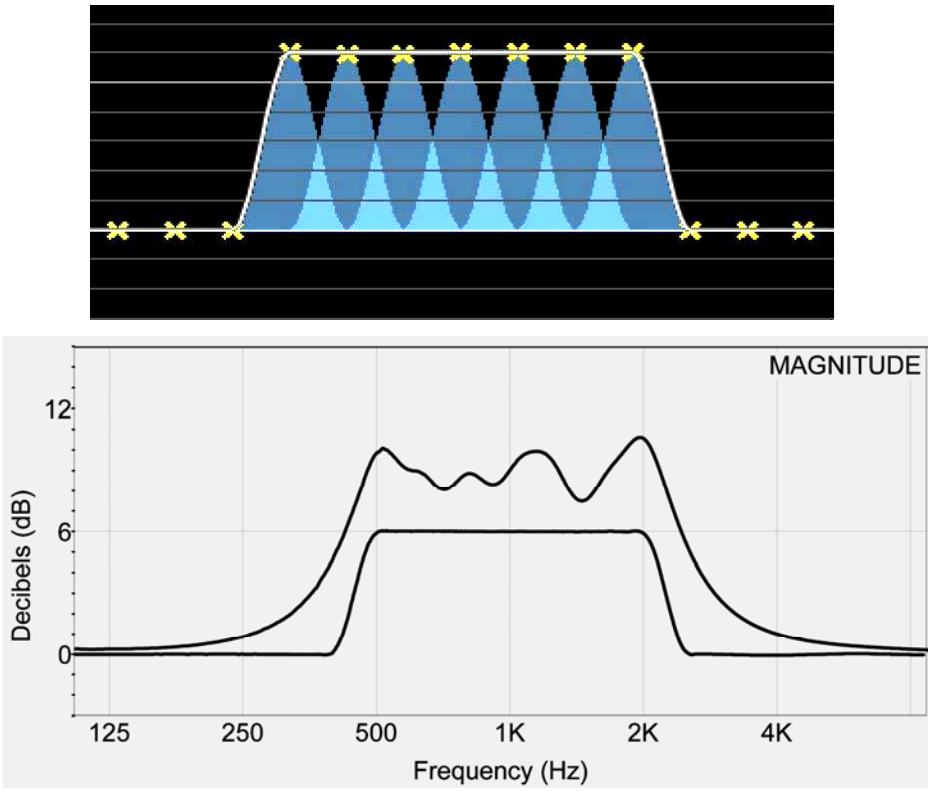


Figure 3-6 Ideal Graphic EQ and Resulting Frequency Response

To implement this EQ overlay:

1. Tap and drag the filter tool on the bottom to **500 Hz**.
2. Tap and drag the red X upward until the filter's gain parameter reads **6 dB**.
3. Perform these steps for each of the frequencies listed.

The bottom trace in Figure 3-6 shows that the adjacent filters on a Contour or Mesa EQ sum to flat, unlike all previous graphic equalizer implementations. This is because of the raised cosine filters that give rise to the Ideal Graphic EQ.

Figure 3-7 shows a traditional third-octave graphic EQ filter (red curve) in comparison to a third-octave raised cosine filter. The area highlighted gray shows the difference between the two filter shapes.

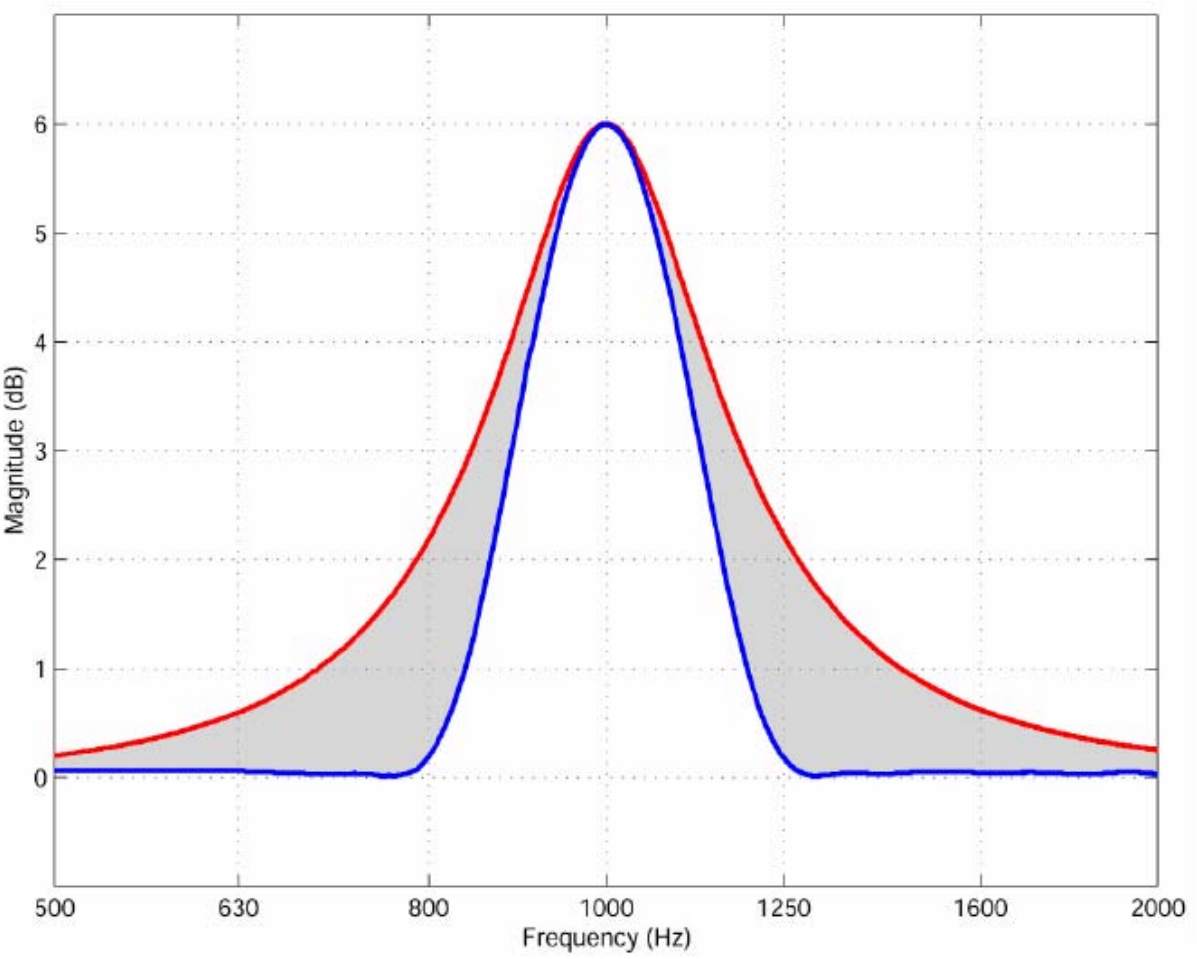


Figure 3-7 Comparison of Raised Cosine (blue) and Traditional Third-Octave Filters

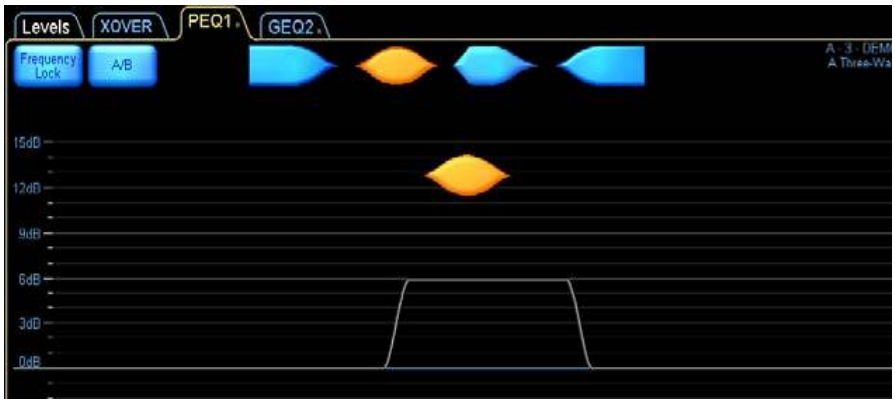
EQ Overlays

The concept of EQ overlays is another innovative feature of the Dolby Lake Processor system. Tap the **PEQ1** tab at the top of the page. **GEQ2** and **PEQ1** are two different EQ overlays. The white line represents the composite response of all EQ overlays. It now shows the wideband 6 dB boost created in the **GEQ2** tab. In the next section, we will see how multiple EQ overlays interact.

3.4.3 Parametric EQ

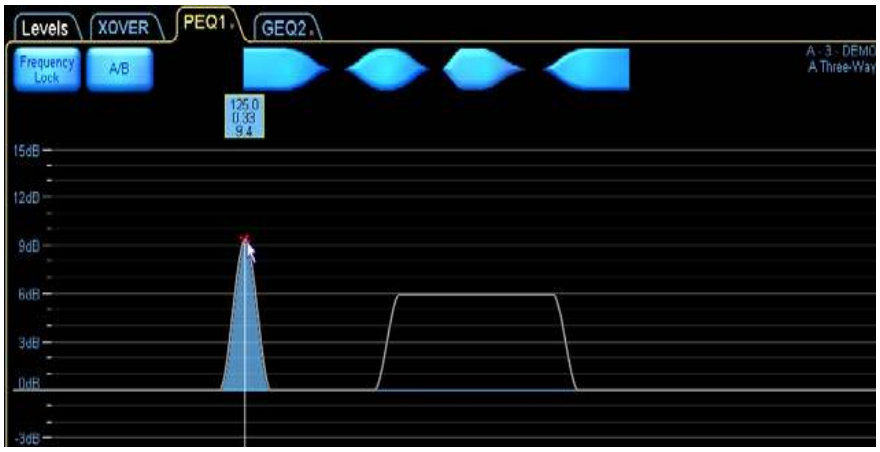
To add a parametric filter to the **PEQ1** overlay:

1. Tap the parametric filter at top of the EQ display.
2. Tap the screen near 125 Hz to insert the filter there.

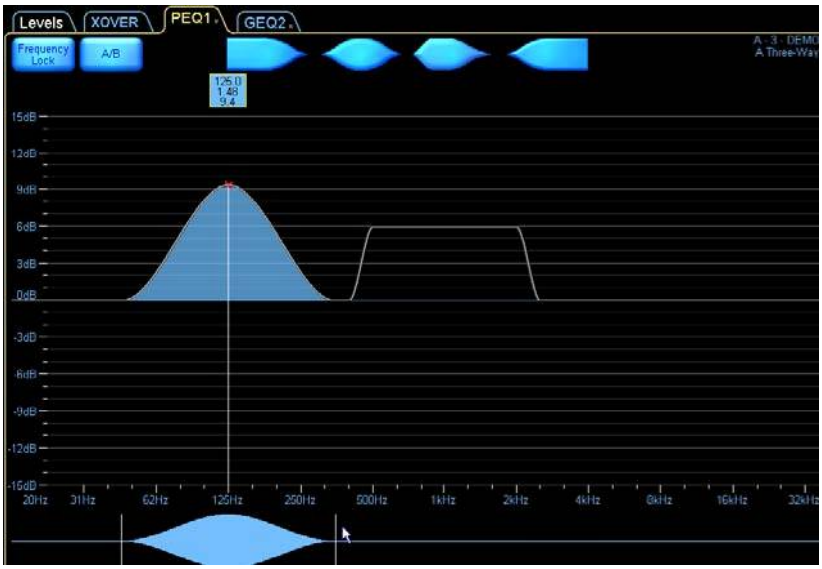


The parametric filter tool is similar to graphic EQ tool except the filter bandwidth is adjustable.

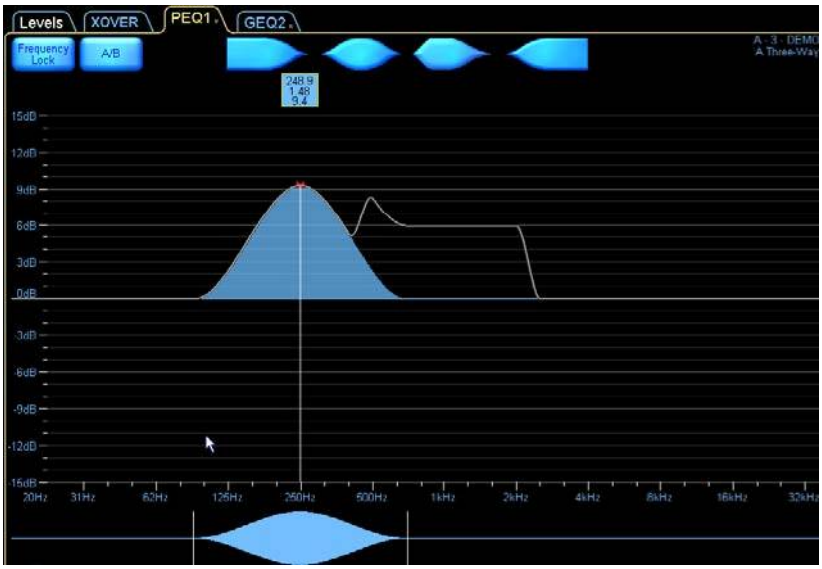
3. Tap and drag the red X up to boost the volume of this frequency.



4. Tap and drag either of the vertical end lines on the filter tool to increase the bandwidth as shown:



5. Change the center frequency of the parametric filter by tapping and dragging inside the vertical divider lines of the EQ tool.



6. Drag the parametric filter into the same frequency range as the GEQ2 filters to see the result of all the filters (the white composite line in the previous figure).

3.4.4 Add a New EQ Overlay

To add a new EQ overlay:

1. Tap **Overlay Functions**.
2. Tap **Overlay New**.

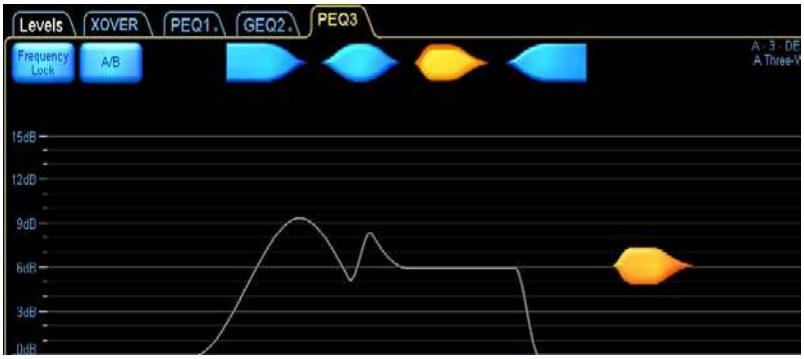
By default, a new overlay is parametric but can be changed to graphic by tapping the **Overlay GEQ** button. You can also change an overlay from graphic to parametric by tapping this same button, which will read **Overlay PEQ** in this instance.

3.4.5 Mesa Filter

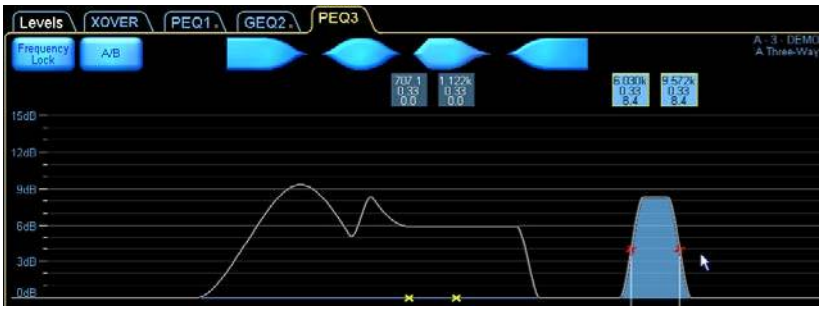
The Mesa filter is a highly versatile filter that can rapidly adjust a loudspeaker's frequency response. The Mesa filter provides a fast, effective optimization tool that truly matches a loudspeaker's asymmetric response. The Mesa filter allows independent adjustment of the slopes and center frequencies of the lower and higher edges.

To add a Mesa filter to the new PEQ3 overlay:

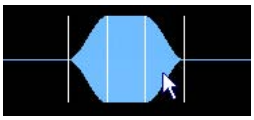
1. Tap the Mesa filter type at the top of the EQ interface.
2. Tap the EQ display near the frequency you wish to insert the Mesa filter.



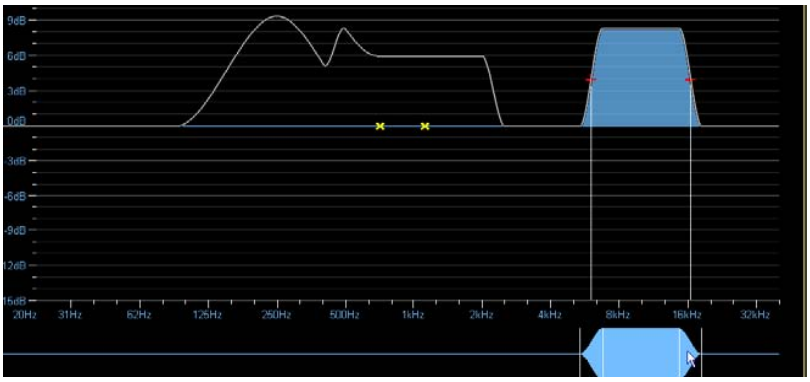
3. Tap and drag up between the red X marks in the EQ display to increase gain.



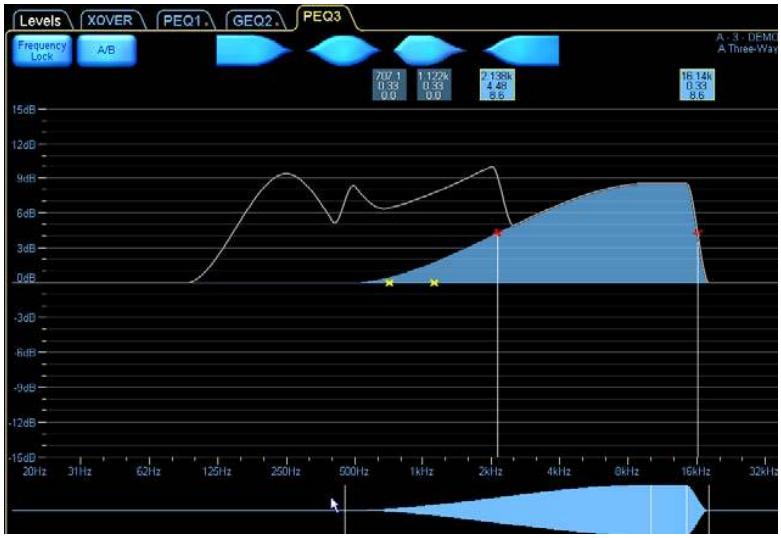
The Mesa filter tool has four dividing lines.



4. Tap between the center and right dividing lines and drag to the right. This spreads the filter points, creating a variable-width flat top.



5. Tap and drag to the left of the far-left divider line.



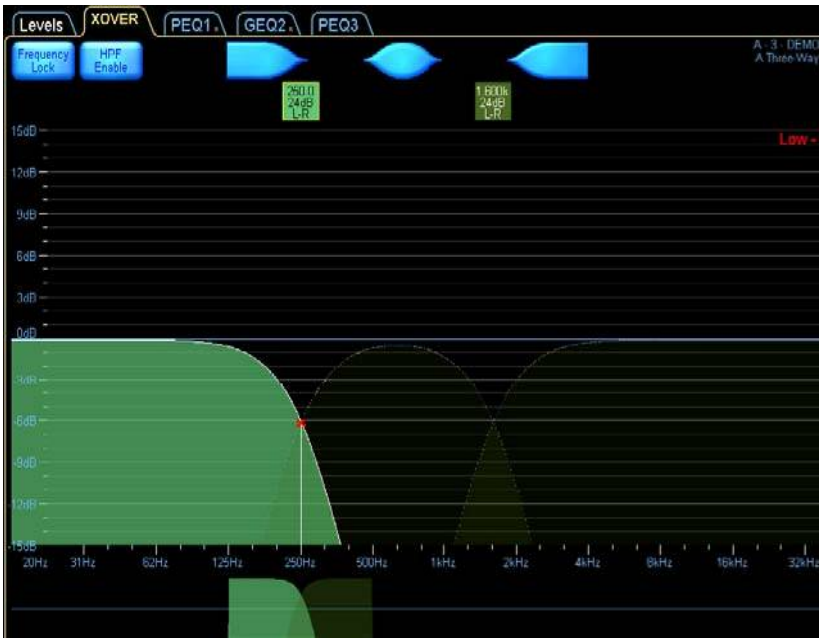
The same principle applies to the high-frequency edge (right side).

6. Tap and drag between the center two divider lines to change the frequency.

3.5 Crossovers

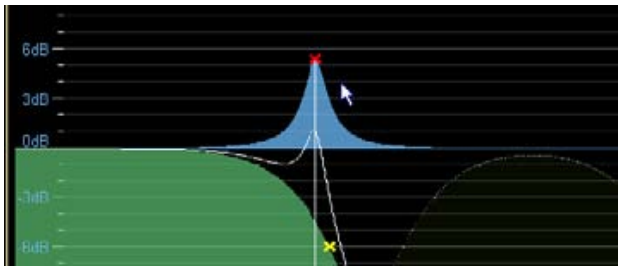
The Dolby Lake Controller, when used in conjunction with Contour loudspeaker modules, allows real-time adjustments to crossovers through the **Xover** screen.

Crossover frequency and type and post-crossover equalization can be adjusted. In the default three-way configuration, the Contour module has 24 dB Linkwitz-Riley crossovers with center frequencies set at 250 Hz and 1.6 kHz. Tap the **Xover** tab to view the crossover interface.



The low-output crossover is selected in this example. Use the crossover tool to change the center frequency. The low and high parts of the crossover are currently combined. Tap the **Crossover Split** button to split the crossover, and drag the crossover selector tool left to reduce the frequencies sent to the low output.

Parametric filters (with the exception of the Mesa filter) can be added to further modify the crossover. Add a parametric filter near the center frequency of the low-output crossover.

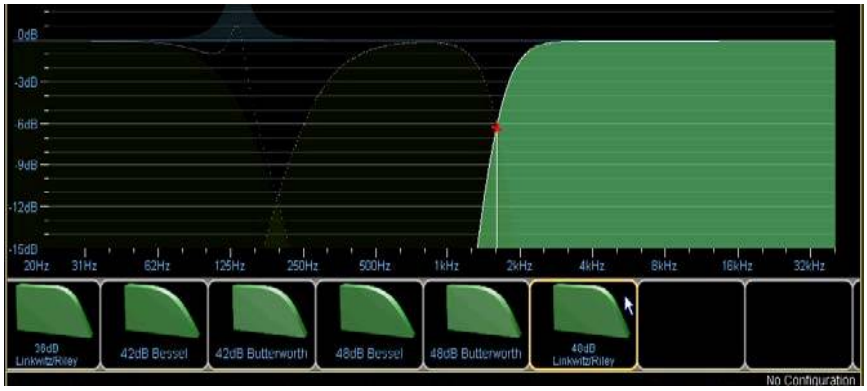


The full response of the parametric filter is shown in blue, but the parametric filter affects only the output it is associated with. The solid white line shows the resulting crossover curve for the low output.

Tap the **Crossover Select** button to display the crossover scroll bar, from which you can select various standard crossover types. If crossover sections are combined, the new crossover selection is applied to both sides of the selected crossover. If crossovers are split, the crossover selection applies only to the currently selected output.

To change the crossover type to a 48 dB Linkwitz-Riley:

1. Tap the **1.6 kHz** filter box to select that crossover.
2. Tap **Crossover Select**.
3. Select **48dB Linkwitz/Riley** from the scroll bar.
4. Tap **Crossover Set**.
5. Tap **Yes** in the dialog box to load the new crossover.



The crossover interface provides a fast and easy method for configuring your loudspeaker system. You can create your own presets or build them based upon data available from speaker manufacturers.

3.6 Groups

The Dolby Lake Controller allows grouping of multiple modules. This unique concept allows the EQ and levels of multiple modules to be changed with a single adjustment. Every module may be a member of up to 28 groups.

All EQ functions available for a module are also available for a group, with a maximum of four EQ overlays per group.

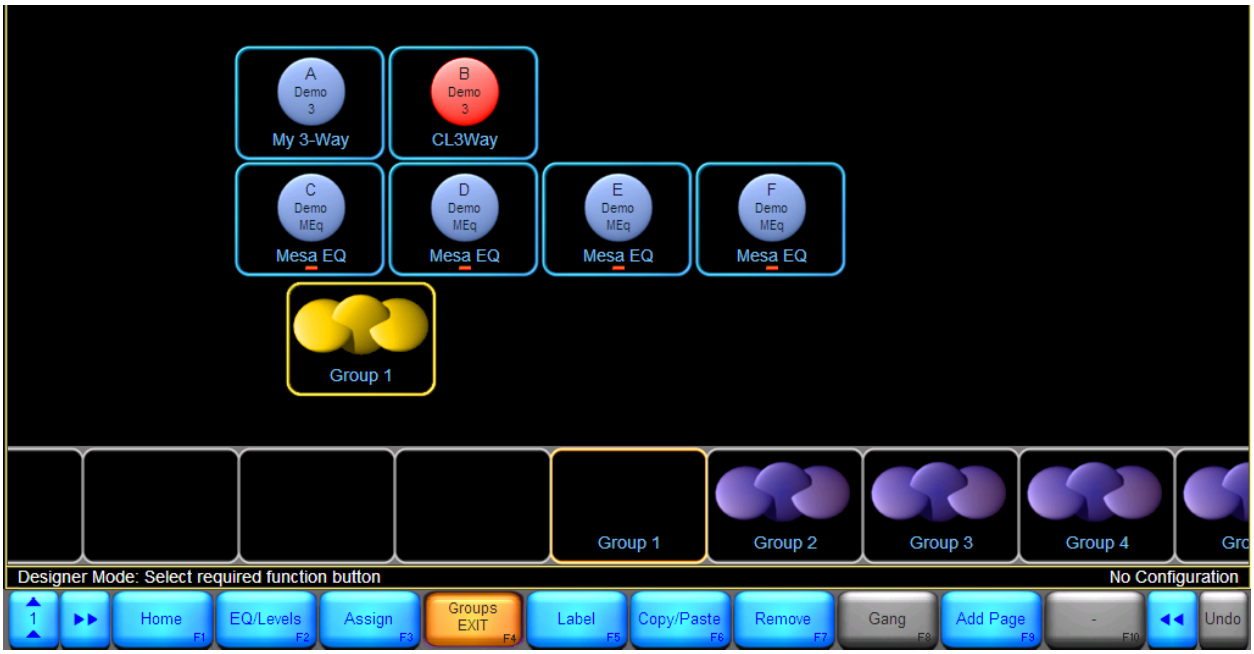
Most Levels functions are also available for groups, except the following:

- LimiterMax RMS Corner
- LimiterMax RMS Attack
- LimiterMax RMS Release
- Input Headroom
- Control of output levels where the group contains modules of varying crossover types (for example, three- and four-way modules assigned to the same group)

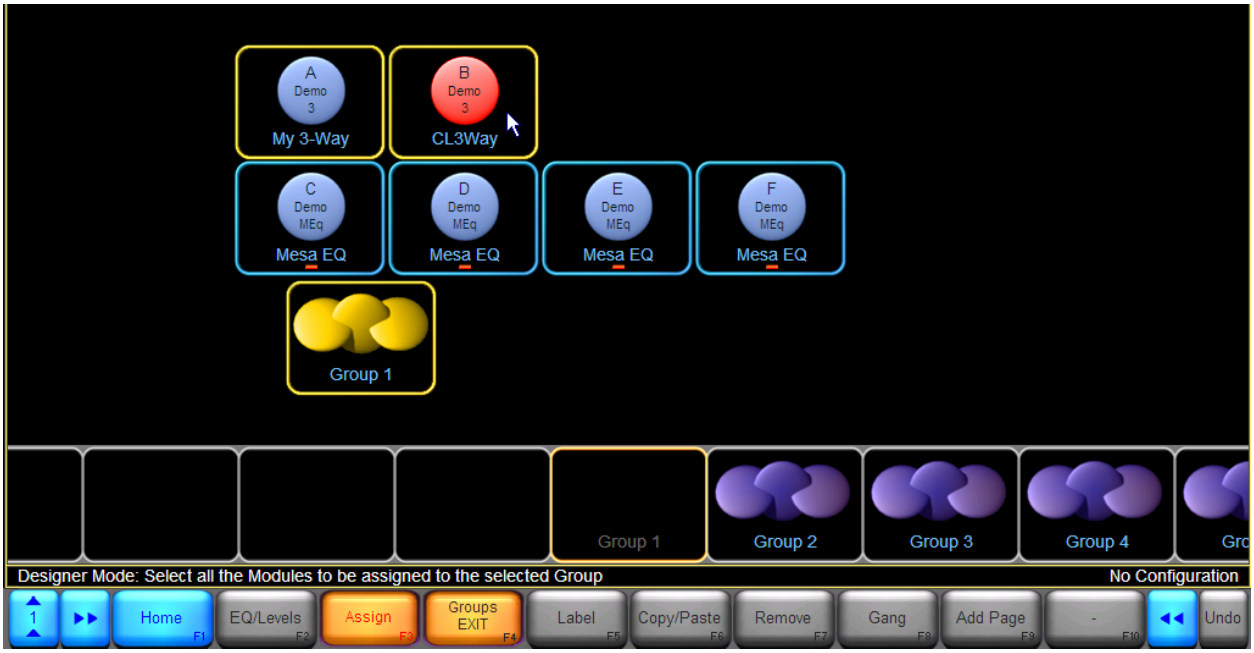
Assigning Modules to a Group

To assign both modules of a frame to a group:

1. Tap the **Home** button to locate to the **Main** page.
2. Tap the **Groups** button to display the groups scroll bar.
3. Tap **Group 1**, and then tap the **Main** page to add the group to your configuration.



4. Tap the **Assign** button, and tap the icons for modules **A** and **B** to group the two Contour loudspeaker processor modules. Assigned modules are highlighted with a yellow border.

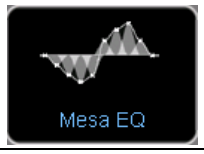
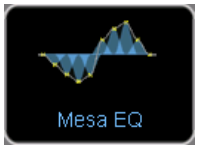


5. Tap the **Assign** button again to exit Assign mode.
6. Tap **Groups EXIT** or **Home** to return to the **Main** page.

3.7 Dolby Lake Controller File Types

Before saving the simple configuration just created, it is useful to learn about the file types used to store and recall settings within the Dolby Lake Controller software. Table 3-3 summarizes the various file types.

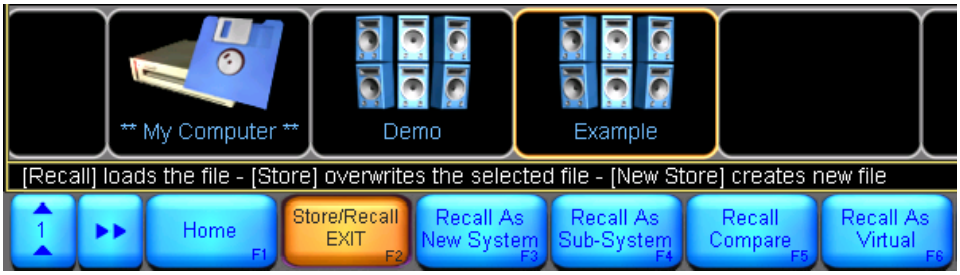
Table 3-3 Dolby Lake Controller File Types

File Type	Description
Contour Base Configuration File (.cbm) Mesa EQ Base Configuration File (.mbm) 	A base configuration file defines a starting point for the module setup. It can contain EQ, crossover, and level settings that can be hidden or protected from end-user adjustment. The result of all EQ, levels, and crossover settings for the module, and any group that it belongs to, can be combined and stored in the base configuration file.
Contour Single Module File (.csm) Mesa Single Module File (.msm) 	These files store all information contained in the base configuration file plus user settings for each module including the mute states, levels (gain, delay, and limiters), and equalization (filters and EQ overlays).
Controller System Configuration File (.csc) 	This file stores/recalls all information contained within all Contour or Mesa single-module files on a given network, and additionally includes generic frame data and all group assignments and settings.

To save a system configuration file:

1. Tap **Home**.
2. Tap **System Store/Recall** to display the scroll bar.
3. Tap the **Store System** button to display the onscreen keyboard.

4. Name the system configuration "Example," and tap **OK**. The system configuration is stored and the file is displayed in the scroll bar.
5. Tap the **Example** file to select it. This activates all recall and store options on the **System Store/Recall** button-bar.



Recall as New System clears current configuration and loads the selected configuration. **Recall as Sub-System** retains the current configuration and appends the selected configuration. **Recall Compare** allows a comparison between the data stored on file and the current system configuration. **Recall as Virtual** loads the data from the file into a virtual offline system. **Store System** stores the entire configuration. **Store Sub-System** stores only the data in the selected modules and groups.

Individual module settings can also be saved to a file. The single-module file stores everything about a particular module, including its EQ overlays, but does not retain frame data (such as I/O config) or group assignments. This file can be recalled into any module of the same type (Contour/Mesa).

To save the settings of a single module:

1. Tap the **Home** button, then tap **Modules**.
2. Select the module **My 3-Way**.
3. Tap **Module Store/Recall**.
4. Tap **File Utilities**, then **New Folder**.
5. Enter the folder name Test, and tap **OK**.
6. Tap **File Util EXIT**.
7. Tap **New Store**, name the file My 3-Way, then tap **OK**.

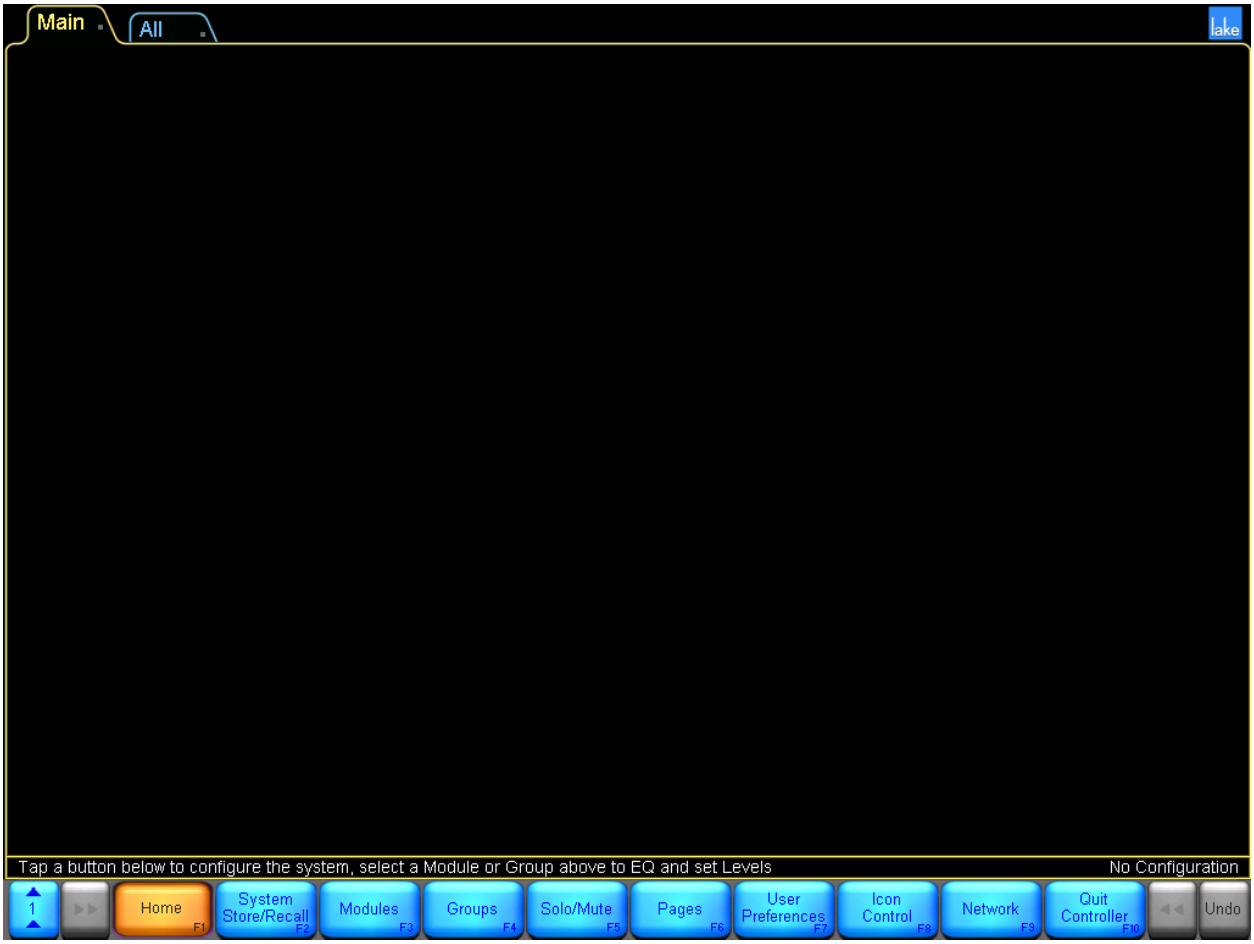
3.8 Conclusion

The preceding tutorial has introduced many of the concepts and features that you will need for regular use of the Dolby Lake Controller. Please refer to the chapters following this tutorial for detailed reference information on all features and functionality of the software.

Home—Menu Reference

This chapter provides detailed information on the top-level structure of the Dolby® Lake® Controller button bar, located at the bottom of every display within the software.

When the Controller starts, the **Main** page, **All** page, and **Home** button bar are displayed.



From the **Home** button bar, you can navigate to every possible user-interface display and function provided by the Controller. Table 4-1 provides a description of each button.

Table 4-1 Home Button Bar

Button	Description
	Available from every display of the Dolby Lake Controller, the **Home** button returns you to the top-level display.
	Accesses the submenu that provides functionality for storing and recalling system configuration files. File utilities are also provided for creating, renaming, and deleting files and folders.
	Accesses the submenu that provides module functions. This is one of the most extensive menus within the Controller, allowing you to access modules, super modules, EQ, levels, I/O Config labeling, locking, copying, pasting, removing, recalling, and storing.
	Accesses the submenu that provides grouping functions. Groups are a powerful component of the Controller, allowing you to group any number of modules into logical partitions. Groups provide EQ level control across the set of modules that are assigned to the given group.
	Accesses the submenu that provides solo and mute functionality. The solo/mute controls allow you to solo modules and groups, and also provide a mode to allow soloing for multiple modules and groups.
	Accesses the submenu that provides page functions. You can add pages, label pages, and move groups and modules between the pages that you create.
	Accesses the submenu that provides user preferences. These functions include contexts, delay units, designer mode functions, keyboard shortcuts, MIDI, graphic options, and show mode.
	Accesses the submenu that provides icon control. You can change the size of icons, and change to the meter icon view.
	Accesses the submenu that provides network functions. You can select between available networks and access multiple-Controller functions.
	Quits the Controller application. You are prompted to confirm this operation.

The menu reference chapters that follow this chapter provide detailed reference for each of the top-level functions on the **Home** button bar.

4.1 Accessing EQ/Levels from Home

When the Dolby Lake Controller displays the **Home** button bar, you can tap any icon on the current page to immediately access the EQ/Levels interface for the given module, super module, or group. This provides instant access to the module or group, without having to navigate through the button bar to gain access to these most important parameters.

Tapping a module icon from **Home** is equivalent to the following sequence:

1. From **Home**, tap **Modules**.
2. Tap a module icon to select the module.
3. Tap **EQ/Levels**.

Tapping a group icon from **Home** is equivalent to the following sequence:

1. From **Home**, tap **Groups**.
2. Tap a group icon to select the group.
3. Tap **EQ/Levels**.

Since the EQ/Levels interface for modules and groups is the most frequently used component of the Dolby Lake Controller, this is the first menu reference chapter to be presented.

EQ/Levels—Menu Reference

The EQ/Levels functionality of the Dolby® Lake® Controller provides a sophisticated and accurate real-time interface to both modules and groups on the network. Modules and groups require different features and functions for setup and configuration; they provide the same EQ and level functionality to the sound engineer, however, for system optimization and during the show. Figure 5-1 shows a general overview of how modules and groups utilize the same EQ/Levels interface for access to the underlying signal processing parameters.

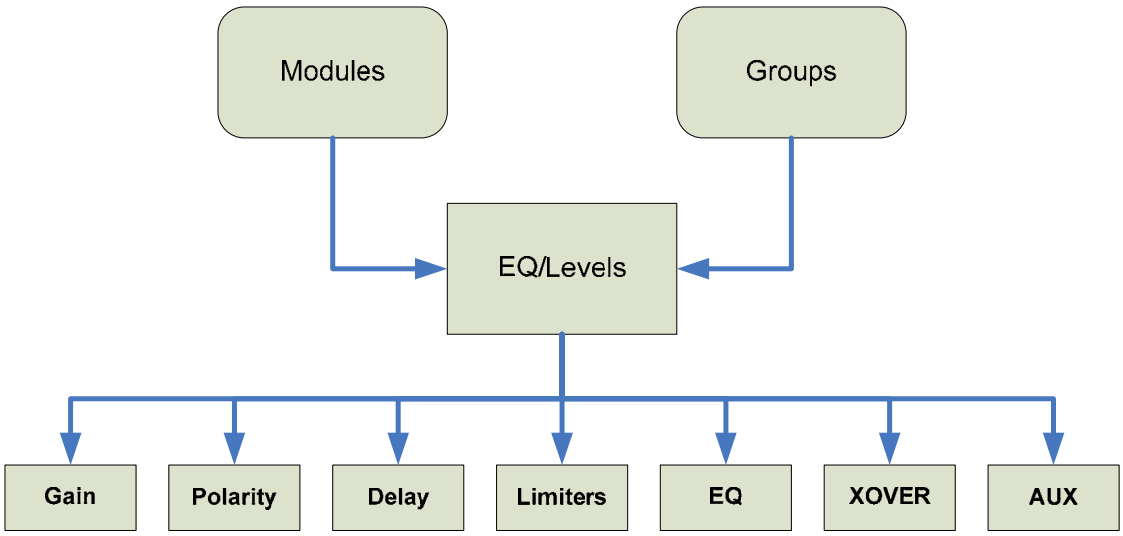


Figure 5-1 EQ/Levels Overview

Modules, super modules, and groups use the EQ/Levels interface to present gain, polarity, delay, limiter, EQ, crossover, and auxiliary output parameters to the sound engineer. When adjusting any of these parameters from a module, the sound engineer makes changes to a single module on the network. When adjusting any of these parameters from a group, the sound engineer makes changes simultaneously to a group of modules on the network.

This chapter provides a menu reference for EQ/Levels functionality, which can be accessed from multiple locations within the Controller.

5.1 EQ/Levels Overview

5.1.1 General Access

The **EQ/Levels** button accesses the following information:

- Module and group parametric EQ (PEQ)
- Module and group graphic EQ (GEQ)
- Module and group levels (gain, delays, limiters, etc.)
- Module crossovers and highpass filter/lowpass filter (HPF/LPF) (Contour™) or HPF/LPF only (Mesa EQ™)

The EQ/Levels functions can be accessed by several methods from the following menu locations:

- **Home**—Tap a module/group icon once.
- **Modules**—Select a module/group icon, then tap the **EQ/Levels** button.
- **Groups**—Select a module/group icon, then tap the **EQ/Levels** button.
- **Solo/Mute**—Select a module/group icon, then tap the **EQ/Levels** button.
- **I/O Config**—Tap a section of the interactive block diagram.

5.1.2 Restricted Access

The Dolby Lake Controller provides security by allowing a system designer to hide parts of the system or set them to View Only. This can be done globally in a system, or for individual modules. This security specification may affect the screens allowed to be displayed when accessing EQ/Levels. Please refer to Chapter 18 for further details.

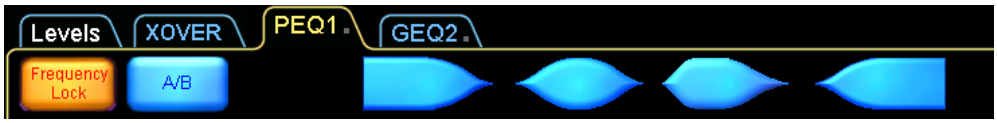
5.1.3 Group Adjustments

Group EQ and levels are view only from a module. To adjust group EQ or levels, access that group's EQ/Levels page via the group's icon.

Note: Groups do not have a crossover page or an HPF/LPF page, but the Gang Xover/Aux and Gang HPF/LPF functions, which are available from the **Groups** menu, can be used to link the crossover or HPF/LPF settings of all modules in a group.

5.1.4 Default Settings

The following example shows the available screens and default EQ overlays for a Contour loudspeaker module placed on the **Main** page of the Dolby Lake Controller.



The default module contains a Classic 3-Way (CL3way) crossover. The default tabs for this module are:

- **Levels**—Displays gains, delays, and limiters
- **Xover**—Displays crossover settings for the module
- **PEQ1**—Parametric EQ overlay (indicated by yellow highlighting)
- **GEQ2**—Graphic EQ overlay

Tap the **Levels** tab to toggle between **Levels** and **EQ**.

5.2 Levels

Figure 5-2 shows the Levels interface for a Classic 3-Way module with letters identifying key features.

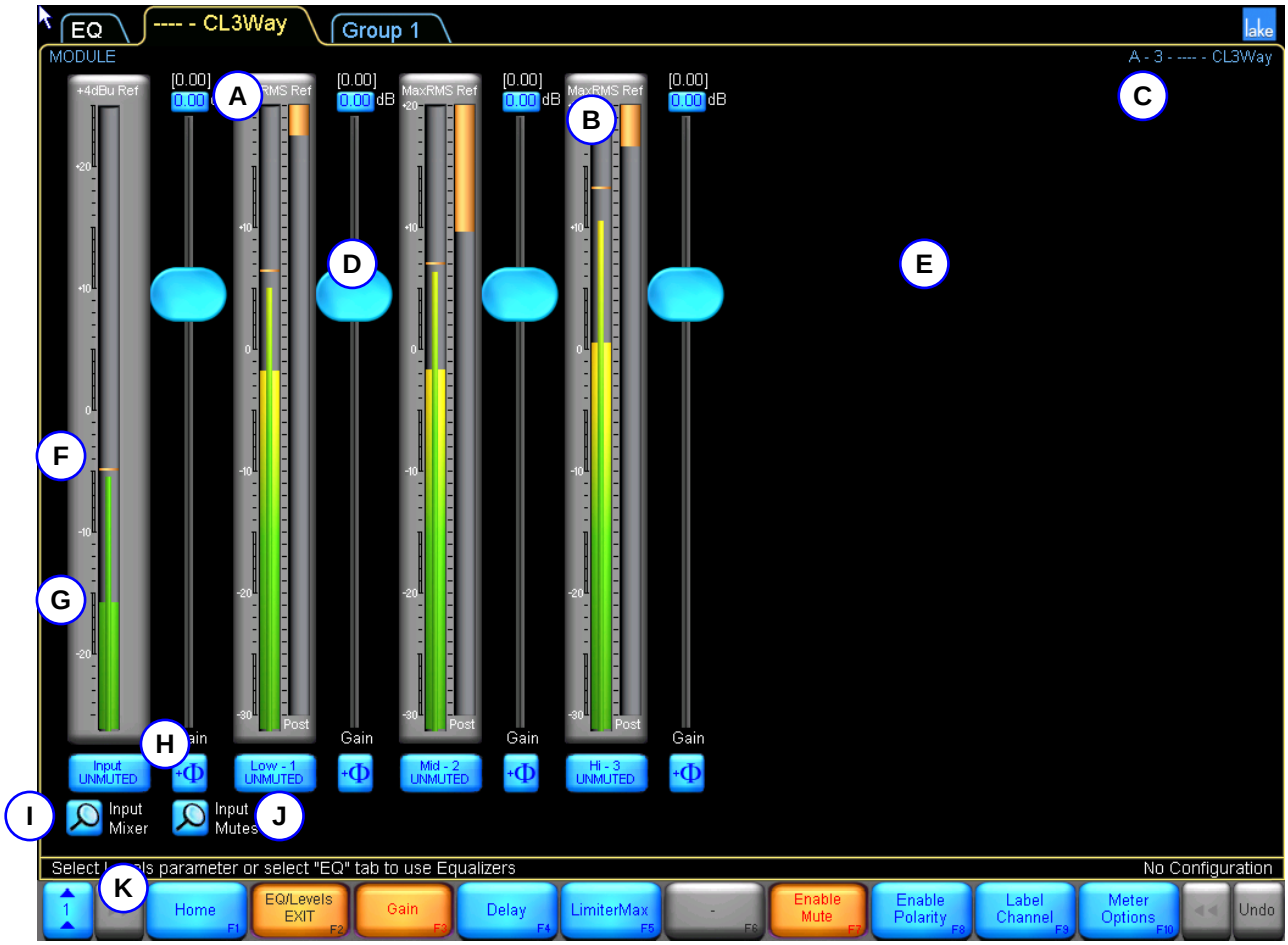


Figure 5-2 Levels Interface for a Classic 3-Way Module

Table 5-1 provides definitions for the labels in Figure 5-2.

Table 5-1 Function Descriptions for the Levels Interface

Label	Function	Description
A	Values	The values for the selected attribute are displayed here. For manual entry, tap the value highlighted in blue, enter a value using the onscreen keyboard (or an external keyboard), and press **OK**. **Modules:** The value presented in brackets represents the overall parameter value, which includes any groups the module is assigned to. The bottom value (in the blue box) represents the value of the module parameter. **Groups:** The group parameter is represented in the blue box.
B	Limiter Indicator	Indicates the total RMS and peak limiting gain reduction with an orange bar that moves downward as gain reduction increases.
C	Frame/Module/Group Label	**Modules:** Displays the selected module's name. **Groups:** Displays the name of the module providing metering.
D	Fader	Drag the fader up or down to adjust its level. Drag below, above, or to the left of the fader to adjust by smaller increments.
E	Additional Outputs	For a 4-, 5-, or 6-way/aux module, the additional output channels appear here. The number of output channels depends on the module type (whether module is 2-, 3-, 4-, 5-, or 6-way/aux).
F	Peak Level/Peak Hold Indicators	Indicates peak level with a thin green bar, and peak hold with a wide orange segment.
G	RMS Level Indicator	Indicates RMS level with a wide green bar.
H	Input Channel Label Mute Button and Polarity Button	The channel label is user defined. The color and label of the mute button identifies the mute status of the channel: A blue Unmuted button (channel unmuted) A red Muted button (channel muted) **Modules:** A red button with blue text denotes the channel has been muted by a group the module is assigned to. The polarity button for the channel is located to the right of the mute button. **Groups:** An orange button with blue text denotes that at least one module in that group has the channel muted. A red mute button with blue text denotes that that channel is muted on all modules in the group. The polarity button is not available at group level.
I	Input Mixer	**Modules only:** Provides access to the Input Mixer, which allows you to enable, disable, and mix audio input channels.
J	Input Mutes	**Modules only:** Provides access to the physical input channel mutes, which will affect all modules on the selected processor.
K	Levels Menu Button Bar	The functions and submenus available on the Levels screens are described throughout in this section.

Level Limits

All levels are subject to limits set by the system designer. If you are unable to change a value to the desired level, this may be due to restrictions set for that channel.

Hidden Output Channels

A system designer may choose to hide an output channel if it is not being used. It is possible that the number of visible output channels will differ from the number suggested by the module type.

5.2.1 Gain

Tap the **Gain** button to display the gain levels for each channel of the selected module/group. To adjust gain values, drag the fader (D) for large increments, drag above or below the fader for fine adjustment, or tap the value (A) for keyboard entry.

5.2.2 Delay

Tap the **Delay** button to display the delay time for each channel of the selected module/group. Delay values can be adjusted in four ways:

- Drag the fader (D) to adjust by large increments
- Drag above or below the fader for fine adjustment
- Drag on the meter to the left of the fader for very fine adjustment
- Tap the delay value (A) for keyboard entry

A total delay of 2,000 ms (input plus output) can be set, subject to level limits set by the system designer.

5.2.3 LimiterMax

Tap the **LimiterMax**™ button to view a submenu containing functions relating to the MaxRMS and MaxPeak limiters.

MaxRMS Level

Tap the **MaxRMS Level** button to display the maximum RMS signal level (dB) allowed at the output. An orange bar moves downward from the top of the channel meter to indicate the limiting amount. To adjust Limiter MaxRMS values, drag the fader (D) for large increments, drag above or below the fader for fine adjustment, or tap the value (A) for keyboard entry.

The MaxRMS Level value is relative to the factory MaxRMS value (dBu). While dragging the fader, the total value is displayed in the status bar as dBu-rms, dBV-rms and Vrms.

MaxRMS Corner

MaxRMS Corner applies to modules only; this function is inactive if a group is selected.

The Limiter Corner softens the MaxRMS limiting by creating a curve that gradually introduces limiting. This function is similar to an audio compressor's knee function. For example, if MaxRMS Level equals –6 dB and Limiter Corner equals –4 dB, limiting begins gradually when the Max RMS level reaches –10 dB and increases until maximum limiting occurs at –6 dB.

Tap the **MaxRMS Corner** button to display the value (dB) for each channel of the selected module. To adjust Limiter Corner values, drag the fader (D) or tap the value (A) for keyboard entry.

MaxRMS Attack and MaxRMS Release

MaxRMS Attack and Release applies to modules only; these functions are inactive if a group is selected.

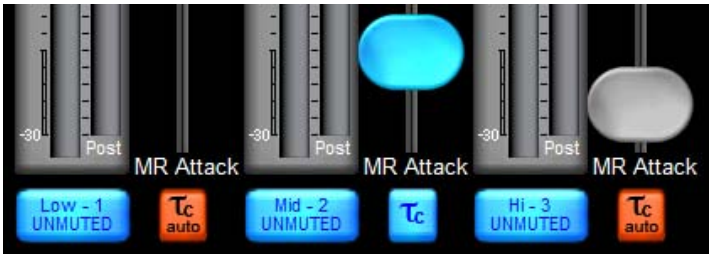
The Attack and Release times (also referred to as "Time Constants") determine the time in milliseconds that the MaxRMS Limiter takes to fully engage and disengage once the MaxRMS Corner level has been reached.

Tap the **MaxRMS Attack** or **MaxRMS Release** button to display the value (ms) for each channel of the selected module. To adjust the value, drag the fader (D) or tap the value (A) for keyboard entry.

Auto Time Constant

The MaxRMS Attack and Release values may be set manually by the user, or may be calculated automatically. Automatic calculation is determined by the crossover frequency of the channel's highpass filter, if applicable. Otherwise, it is fixed at 160 ms.

The **τc Auto** button is displayed underneath the slider when viewing either the Attack or Release settings. When the **τc Auto** button is enabled (Orange), the slider is disabled and the Attack or Release values are calculated automatically.



MaxPeak Level

Tap the **MaxPeak Level** button to display the maximum peak signal level (dB) allowed at the output.

The MaxPeak Limiter process is disabled when the total MaxPeak level (including Group and Factory settings) is 25 dBu or greater.

An orange bar moves downward from the top of the channel meter to indicate the limiting amount. To adjust Limiter MaxPeak values, drag the fader (D) for large increments, drag above or below the fader for fine adjustment, or tap the value (A) for keyboard entry.

The MaxPeak Level value is relative to the factory MaxPeak value (dBu-pk). While dragging the fader, the total value is displayed in the status bar as dBu-pk, dBV-pk, and Vpk.

5.2.4 Input Headroom

This function is available only for Modules on the Contour Pro26 and Mesa Quad EQ™. Input Headroom is configured via **I/O Config > Input Configuration** for the Dolby Lake Processor, and is not available for groups.

To adjust input headroom values, drag the fader (D) for large increments, drag above or below the fader for fine adjustment, or tap the value (A) for keyboard entry.

5.2.5 Enable Mute

This button locks and unlocks the mute buttons and is active by default (that is, muting or unmuting is allowed). When the button is active (orange), channel muting via the Controller is enabled. When the button is inactive (blue), channel muting is disabled.

5.2.6 Enable Polarity

This button locks or unlocks the polarity buttons and is inactive by default (polarity buttons locked). When the button is active (orange), the polarity can be changed. When the button is inactive (blue), the polarity cannot be changed.

Note: If a system designer has locked out polarity changes on one or more outputs, the polarity button for the outputs will not be displayed in User mode.

5.2.7 Label Channel

This function applies to modules only and is inactive if a group is selected. Channel labels for groups are derived from the module that has been assigned for metering purposes as just described.

The channel label is a user-defined value that appears on the mute button at the bottom of each channel, the module **I/O Config** page, and on any auxiliary output EQ tabs.

To label a channel:

1. Access a module **Levels** page through a module icon.

2. Tap **Label Channel**, then tap the required channel label/mute button.
3. Enter the channel label using the onscreen keyboard (or an external keyboard).
4. Tap **Label Channel** to exit this mode.

5.2.8 Meter Options

Tap the **Meter Options** button to view a submenu containing functions relating to alternate meter views and system designer features.

Input +4dBu Reference

Tap the **Input +4dBu Reference** button to view the physical input signal meter relative to +4 dBu. Tap the button again to return to the default Digital Clip (DClip) view.

The DClip metering mode shows the audio level prior to any gain adjustment (input headroom, or digital gain offset), and indicates when the A/D converters will clip. The +4 dBu metering mode shows the audio level after any gain adjustment, and is useful for comparing levels of different input signals prior to processing.

This is a global function; all physical input meters throughout the system display the reference selected here.

Pre Limiter

Tap the **Pre Limiter** button to view the prelimiter output signals. Tap again to return to post-limiter mode. This is a global function; and all meters throughout the system display the reference selected here.

Note: The limiter status is identified on the bottom right of each output meter above the channel label/mute button.

AmpClip Reference

Tap the **AmpClip Reference** button to view output signals with respect to the AmpClip reference level. Tap again to return to the normal view, which is relative to the factory MaxRMS level as defined using Designer Mode.

When **AmpClip Reference** is selected, the Amp Clip level is used as the reference for the 0 dB level on the meter. With correct settings, the output meter will identify the onset of clipping.

AmpClip Reference is a global function; all meters throughout the system display the reference selected here.

Assign Meters

The Assign Meters function is active only when a group **Levels** page is accessed via a group icon. For metering purposes, a module may be assigned to a group. This provides an overview of the input/output signals for that group.

When a group is created, the first module to be assigned to that group is assigned to metering automatically.

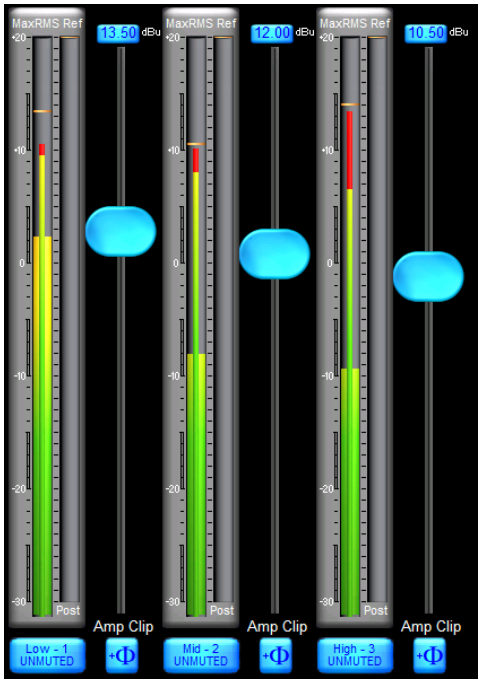
To assign a module to a group for metering purposes:

1. Access a group **Levels** page through a group icon.
2. Tap **Meter Options**, then tap **Assign Meters**.
3. The module scroll bar appears displaying modules assigned to the selected group.
4. On the scroll bar, tap the module you wish to use for metering.
5. Tap **Assign Meters** again, then **Meter Options Exit** to exit this mode.

AmpClip

AmpClip provides a parameter for scaling the output metering of the Dolby Lake Processor to calibrate the clipping point to a given amplifier's sensitivity. This value (the AmpClip reference level) is set in dBu and is a sum of the factory AmpClip value (dBu) and the user AmpClip value (dB).

In both AmpClip Reference and MaxRMS Reference metering modes, the output peak meters will turn red at the AmpClip reference level to indicate possible output clipping as shown in this figure.



Peak Meter Bar turns red at the AmpClip reference level.

Level Limits

This function button is visible only in Designer Mode, and is used for setting minimum and maximum values for all Levels attributes described in this chapter.

Adjust Factory

This function button is visible only in Designer Mode and is used for defining default level settings and level limits for all attributes described in this chapter.

The Controller has two types of input EQ: Mesa Parametric EQ™ and Ideal Graphic EQ™. Additional parametric output EQ is available on the **Xover** page and **Aux** tabs. This section deals with input EQ.

Groups and modules can have multiple layers of EQ, called EQ overlays. Each module can have up to eight EQ overlays, and each group can have up to four EQ overlays. A module can have up to 256 input EQ filters distributed amongst these EQ overlays. Although this may sound extreme, the large number of filters is necessary in order to allow for sophisticated grouping of Ideal Graphic EQ overlays.

A module's overall input EQ response is calculated by combining its input EQ overlays with those of all groups to which that module is assigned. The resulting composite EQ curve is indicated by a white line that is displayed on all overlays.

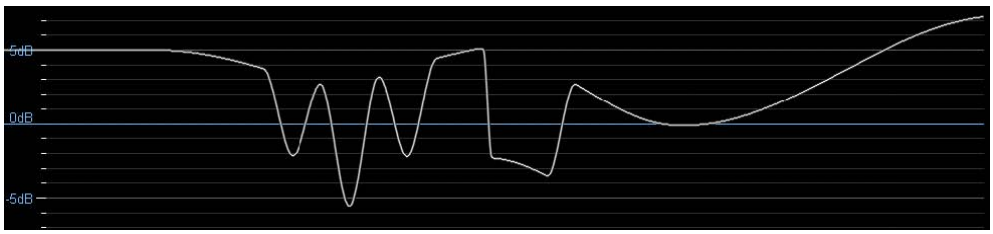


Figure 5-3 Sample Composite EQ Curve

5.2.9 Default Overlays

Modules and groups both use the same EQ overlays and EQ functions. If a module is assigned to a group, the group EQ overlays can be viewed from the module but cannot be updated. Changes to group EQ are performed by accessing the group's controls.

By default, a module has parametric (PEQ1) and graphic EQ (GEQ2); a group has a single parametric EQ (PEQ1). These EQ overlays cannot be removed.

5.2.10 Hidden Overlays

A system designer can:

- Hide specific overlays
- Hide all overlays throughout the system
- Set specific overlays to View Only
- Set all overlays to View Only

It is important to be aware that there may be an overlay present that affects the overall EQ curve, but is not accessible by the end user.

5.2.11 Parametric EQ Screen

Figure 5-4 shows a parametric EQ (**PEQ1**) screen, including letters marking its key functions.

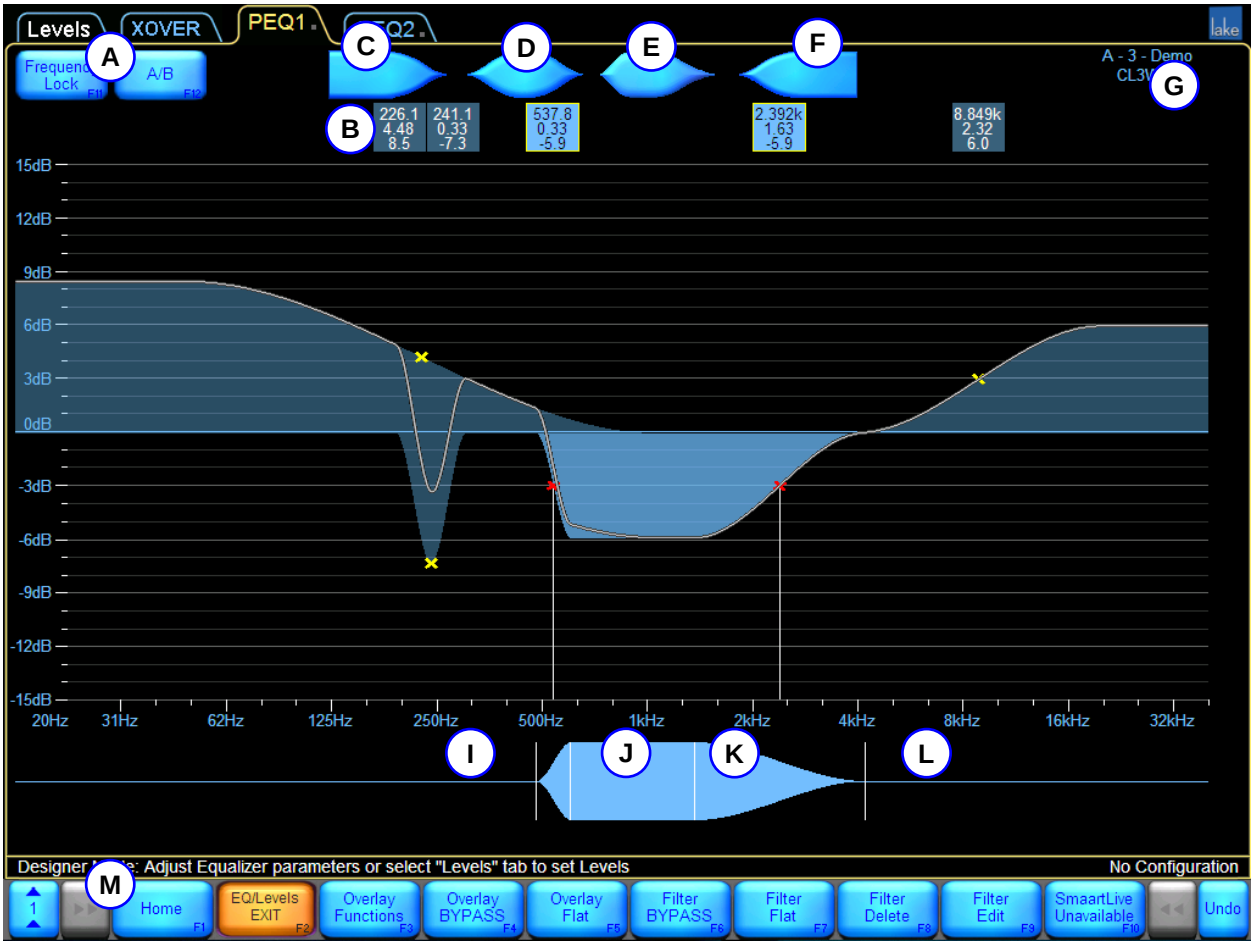


Figure 5-4 Mesa Parametric EQ Screen

Table 5-2 defines the functions labeled in Figure 5-4.

Note: When a default module configuration is loaded, the PEQ overlay contains a set of default filters for use on the front panel of the Dolby Lake Processor.

Table 5-2 Function Descriptions for Mesa Parametric EQ Screen

Label	Function	Description
A	Frequency Lock and A/B Buttons	**Frequency Lock:** Blue = filter frequency unlocked Orange = filter frequency locked When locked, the frequency of the selected filter can only be adjusted using the EQ Tool (J). **A/B:** Tap this button to create a bypassed copy of the selected overlay. EQ adjustments can then be made and quickly compared.
B	Filter Box	Displays the frequency, bandwidth, and gain values of each filter. Tap a filter box to select a particular filter. Double-tap the filter box to switch to Fine Adjustment mode. Drag the filter box down to bypass the filter. Drag the filter box up to insert. Drag the filter box off the top of the screen to delete.
C	Low Shelf Filter	Boost/cut low frequencies. Unlike traditionally implemented shelf filters, the Mesa EQ shelf filter can be adjusted from very shallow to extremely steep filter slopes.
D	Parametric Filter	Boost/cut a specified frequency band, from one-tenth of an octave to multiple octaves of bandwidth.
E	Mesa Filter	The unique Mesa filter contains two filter points that can be adjusted on either side to create a steep peak or a gentle slope with a variable-width flat-top frequency response.
F	High Shelf Filter	Boost/cut high frequencies. Unlike traditionally implemented shelf filters, the Mesa EQ shelf filter can be adjusted from very shallow to extremely steep filter slopes.
G	Module Icon	Displays the currently selected module and status information.
H	Filter Shape EQ Curve	The selected filter is highlighted in light blue. The overall EQ curve is identified by a white line.
I	EQ Tool (Left Side)	Adjusts the filter bandwidth for parametric, Mesa, and high-shelf filters by dragging left or right.
J	EQ Tool (Center)	Changes the frequency of the selected filter by dragging left or right.

Label	Function	Description
K	EQ Tool (Flat Top)	Drag left or right at this point on either side of (J) to adjust the flat-top width of the Mesa filter.
L	EQ Tool (Right Side)	Adjusts the filter octave width for parametric, Mesa, and low-shelf filters by dragging left or right.
M	EQ Menu Button Bar	The functions and submenus available on the EQ overlays are described in the following sections.

To add an EQ filter to a parametric EQ overlay:

1. Tap the required parametric EQ shape (C, D, E, or F).
2. Tap again anywhere on the EQ curve (H).
3. Boost/cut the frequency gain by dragging the filter point up or down.

Note: If a mouse with a wheel is attached, you can use the wheel to adjust the gain.

4. Adjust the frequency by dragging the filter point left or right.

If Frequency Lock (A) is active (orange), you cannot adjust the frequency by dragging the filter point in the main EQ overlay display. Deactivate Frequency Lock (A) or use the EQ Tool (J) to adjust frequency.

5.2.12 Graphic EQ Screen

The Dolby Lake Controller provides a 28-band graphic EQ (GEQ) overlay. Figure 5-5 shows the Graphic EQ (**GEQ2**) screen along with letters marking its key functions.

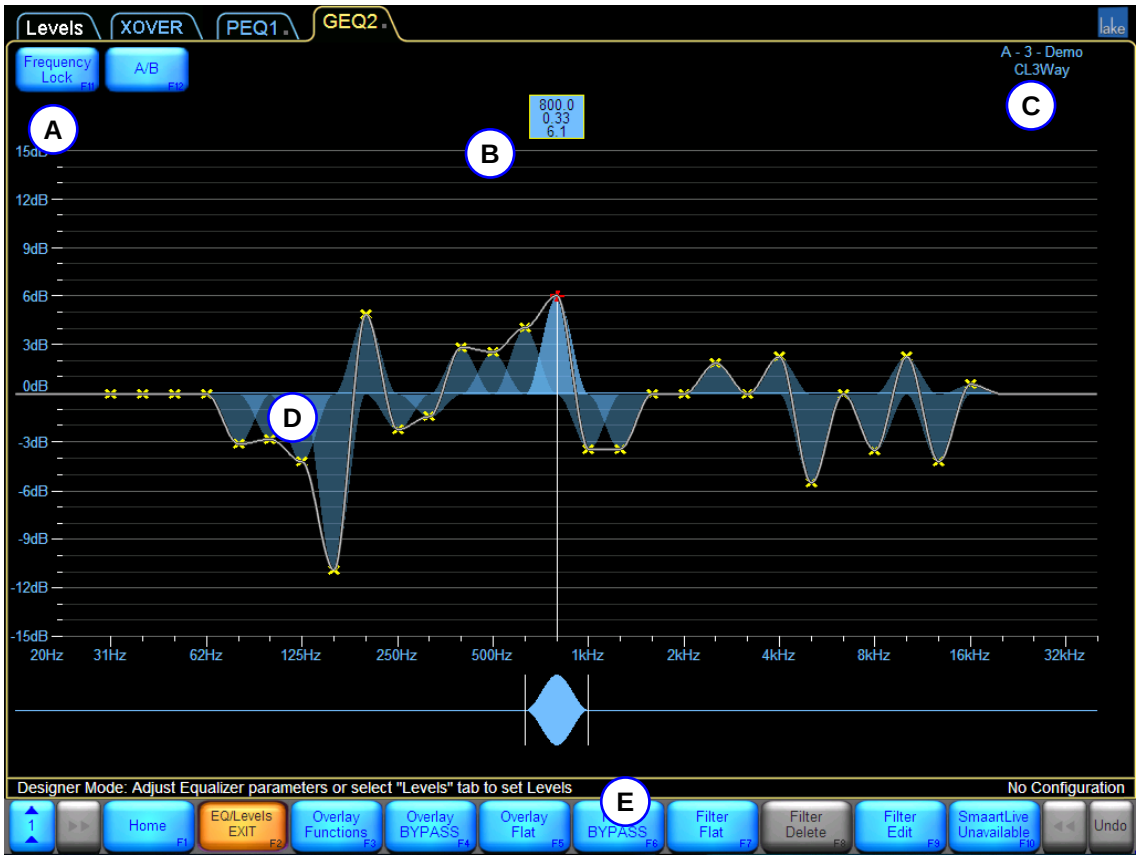


Figure 5-5 Ideal Graphic EQ Screen

Table 5-3 defines the functions labeled in Figure 5-5.

Table 5-3 Function Descriptions for Graphic EQ Screen

Label	Function	Description
A	Frequency Lock and A/B Buttons	**Frequency Lock:** Blue = filter frequency unlocked Orange = filter frequency locked When locked, the frequency of the selected filter can only be adjusted using the EQ Tool (E). **A/B:** Tap this button to create a bypassed copy of the selected overlay. Adjustments can then be made to one overlay and instantly compared to the original overlay.
B	Filter Box	Displays the frequency, bandwidth, and gain values of each filter. • Tap a filter box to select a particular filter. • Double-tap the filter box to switch to Fine Adjustment mode. • Drag the filter box down to bypass the filter. • Drag the filter box up to insert.
C	Module Icon	Describes the currently selected module and status.
D	EQ Curve	A white line identifies the overall EQ curve.
E	EQ Tool	Drag the EQ Tool left or right to select the frequency to change.

To add graphic EQ:

1. Select the filter point to adjust using the EQ Tool (E).
2. Drag the filter point up or down to increase or decrease gain.

If **Frequency Lock** (A) is inactive, you can also tap a filter point to select it and drag up or down to adjust the gain.

5.2.13 Input EQ Menu Reference

The button bar presented while viewing the **Input EQ** display provides a number of applicable functions for adjusting EQ and configuring EQ overlays.

Overlay Functions, immediately to the right of the **EQ/Levels** button, provides a submenu with the following items:

Overlay Properties/EQ Preferences

In User Mode, the only function active under the **Overlay Properties** menu is **EQ Preferences**, which provides a submenu containing functions that control the view of the EQ scale and screens.

Separate settings can be stored for crossover EQ and input/auxiliary EQ. Therefore, most changes made using **Overlay Properties/EQ Preferences** affect only the input and auxiliary output EQ scales.

Table 5-4 EQ Preference Descriptions

Function	Description
No Scale	Removes the scale lines on all EQ/Crossover and Auxiliary screens.
Reset Scale	Resets the EQ scale to the default setting of ±15 dB.
Zoom In	Zooms the EQ scale in by 3 dB increments (for example, if scale is ±15 dB, tapping **Zoom In** will change the scale to ±12 dB).
Zoom Out	Zooms the EQ scale out by 3 dB increments (for example, if scale is ±15 dB, tapping **Zoom Out** will change the scale to ±18 dB).
EQ Pref Exit	Returns the previous menu level.
Full Response	Available only for Crossover and Auxiliary Output screens. When active (orange), the overall EQ curve is shown, taking into account all crossovers, highpass and lowpass filters, output EQ and input EQ for the module and any groups it is assigned to. Not applicable for input EQ screens (PEQ/GEQ).
Up	Moves the zero line up in 3 dB increments.
Down	Moves the zero line down in 3 dB increments.

Overlay Hide/Overlay View Only

These functions are active only when in Designer Mode. Please refer to Chapter 18.

Overlay GEQ/Overlay PEQ

This button's label changes depending on the currently selected overlay type.

If a parametric EQ (PEQ) overlay is selected, the button reads **Overlay GEQ.** Tapping it flattens all PEQ and converts the overlay to a graphic EQ.

If a graphic EQ (GEQ) overlay is selected, the button reads **Overlay PEQ.** Tapping it flattens all GEQ and converts the overlay to a parametric EQ.

Overlay Delete

Overlay Delete is inactive for the default overlays. An overlay created by a user may be deleted by selecting the overlay and tapping **Overlay Delete**. If the overlay contains filters, a warning message will be displayed.

Overlay Copy

Tap **Overlay Copy** to copy the selected overlay. This function is used in conjunction with **Overlay Paste Over**.

Overlay New

Tap **Overlay New** to create a new PEQ overlay. This can be changed to a GEQ overlay (refer to the previous Overlay GEQ/PEQ section).

Note: Each module can have up to eight overlays; groups can have up to four.

Overlay Paste Over

After using the **Overlay Copy** action, tapping **Overlay Paste Over** pastes the copied data into the selected overlay, overwriting its previous content.

Overlay Label

Overlay Label is a user-defined value that appears on the overlay tab at the top of the screen.

To label an overlay:

1. Tap the desired overlay tab.
2. Tap **Overlay Label**.
3. Enter the label name using the onscreen keyboard (or an external keyboard).
4. Tap **OK**.

5.2.14 Overlay Bypass/Overlay Insert/Overlay Compare

This button's label changes depending on whether the selected overlay is currently active or bypassed.

If the overlay is active, the button reads **Overlay Bypass**. Tap the button to bypass the overlay. A bypassed overlay is displayed at the bottom of the screen, just above the button bar.

If the overlay is bypassed, the button reads **Overlay Insert**. Tap the button to insert the overlay. An active overlay is displayed at the top of the screen.

If a bypassed overlay is placed directly underneath an active overlay, the button reads **Overlay Compare**.

Note: An overlay can also be bypassed by dragging the overlay tab down to the bottom or inserted by dragging up to the top of the screen. In Compare mode, dragging either overlay up or down swaps the active/bypassed overlay.

A/B Overlay Compare

In addition to the bypass feature, you can compare two overlays within a module or group. The two ways to create an A/B comparison are described in the following sections.

Using the A/B Button

The A/B button at the top left of the screen creates a bypassed copy of the selected overlay. Changes can then be made to one of the overlays, and compared by tapping **Overlay Compare**.

Comparing Existing Overlays

Follow this process to compare two existing EQ overlays:

1. Tap **overlay A** to select it.
2. Tap **Overlay Bypass**.

   Overlay A is now at the bottom of the screen.
3. Tap and drag **overlay A** left or right along the bottom of the screen until it is aligned directly underneath the EQ overlay you wish to compare.
4. Tap **Overlay Compare**.

Each time the button is tapped, the two overlays switch positions—the top overlay is active and the bottom is bypassed.

5.2.15 Overlay Flat

Tap **Overlay Flat** to flatten and delete all filters from the selected overlay. This function is inactive if the selected overlay does not contain any filters.

5.2.16 Filter Bypass/Filter Insert

The button label changes depending on whether the selected filter is active or bypassed. The button reads:

Filter Bypass—If the filter is active; tap it to bypass the filter.

Filter Insert—If the filter is bypassed; tap it to insert the filter.

The filter edit box of a bypassed filter is positioned slightly lower than an active filter's edit box and does not have a yellow border when selected.

Note: A filter can be bypassed/inserted by dragging the filter edit box down (bypass) or up (insert).

5.2.17 Filter Flat

Tap **Filter Flat** to flatten the selected filter. This sets the filter gain to zero, but frequency and bandwidth remain unchanged.

Filter Flat is inactive if the selected overlay does not contain any filters.

5.2.18 Filter Delete

Tap **Filter Delete** to remove the selected filter from the overlay.

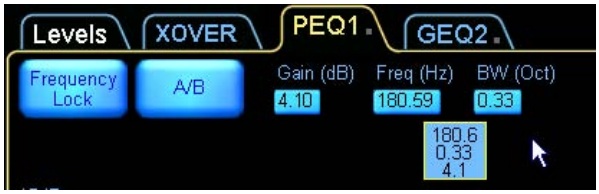
Note: A PEQ filter can be deleted by dragging the filter box upward off the screen.

Filter Delete is inactive if the selected overlay is a:

- Graphic EQ, because its filter points are fixed and cannot be deleted
- Parametric EQ overlay without any filters

5.2.19 Filter Edit

This function allows manual entry of gain (dB), frequency (Hz), and bandwidth (octave) for the selected filter. If a PEQ overlay is selected and the **Filter Edit** button is pressed, the parametric shapes are replaced with the values of the selected filter.



To adjust filter parameters using filter edit:

1. Tap the overlay to select it.
2. Tap the filter box, or use the EQ Tool to select the filter.
3. Tap **Filter Edit**.
4. Tap the gain, frequency, or bandwidth value (highlighted in blue).
5. Enter the value required using the onscreen keyboard (or an external keyboard), and tap **OK**. The Filter Edit function is inactive if the selected overlay does not contain any filters.

Note: High-frequency values can be entered using *k* to denote kHz, instead of Hz (for example, 12k instead of 12,000 Hz).

5.2.20 Analyzer Bridge/Analyzer Unavailable

The Dolby Lake Analyzer Bridge provides an interface between the Dolby Lake Controller and certain audio analyzer.

The Dolby Lake Analyzer Bridge provides spectrum, spectrograph, and transfer function displays on the Xover, Aux, and EQ overlays.

If both an approved analyzer and the Dolby Lake Analyzer Bridge are identified on the network, this button will read **Analyzer Bridge**. If either your analyzer or the Analyzer Bridge is not present on the network, the button will read **Analyzer Unavailable**.

5.2.21 High-Precision Filter Adjustments

Double-tap the filter parameters box so it turns from its normal appearance to a gray outline and gray text. This switches from Normal Adjustment to Fine Adjustment mode. To return to Normal Adjustment mode, tap the filter box once. Fine Adjustment mode is also implemented globally when Show mode is selected.

5.3 Crossovers and HPF/LPF

The **Xover** and **HPF/LPF** screens display the crossover and/or HPF/LPF information for the selected module, depending on the module type. The **Xover** and **HPF/LPF** screens do not apply to groups**.**

To view the **Xover** screen:

1. Access EQ/Levels, and tap the **EQ** page tab at the top left of the screen.
2. Tap the **Xover** or **HPF/LPF** tab next to Levels at the top of screen.

Figure 5-6 shows the **Xover** screen along with letters marking its key functions.

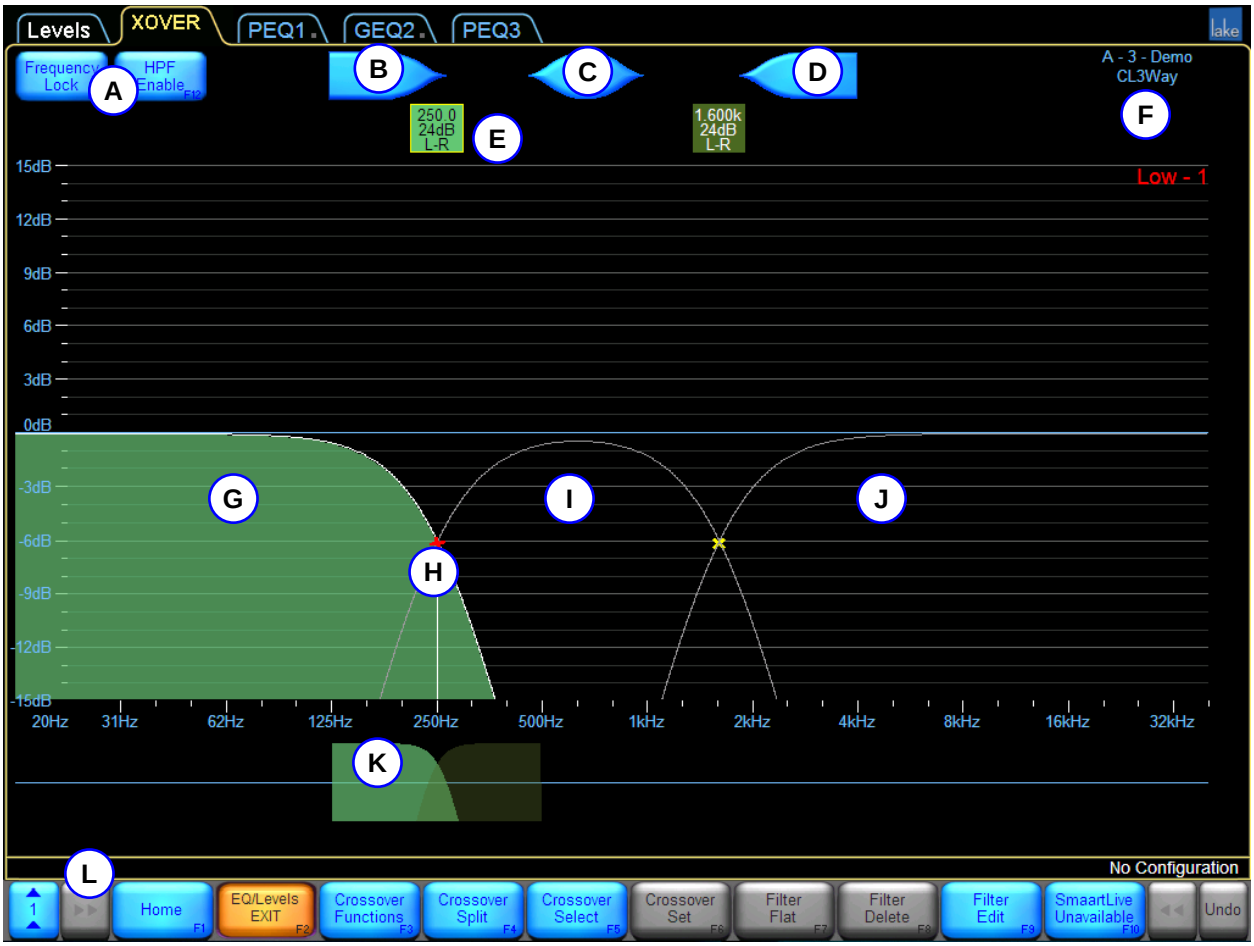


Figure 5-6 Xover Screen

Table 5-5 defines the functions labeled in Figure 5-6.

Table 5-5 Function Descriptions for Xover EQ Screen

Label	Function	Description
A	Frequency Lock and HPF Enable Buttons	**Frequency Lock:** Relevant to parametric filters only (B, C, and D). Blue = filter frequency unlocked Orange = filter frequency locked (when locked, frequency can be adjusted only with the EQ Tool) **HPF Enable:** Activates or deactivates the highpass filter (HPF) for the module. Blue = HPF disabled Orange = HPF enabled
B	Low Shelf Filter (Xover/Aux)	Used to boost/cut low frequencies.
C	Parametric Filter (Xover/Aux)	Used to boost/cut a specified frequency band.
D	High Shelf Filter (Xover/Aux)	Used to boost/cut high frequencies.
E	Filter Edit Box	Displays the crossover or HPF/LPF center frequency and type, depending on the filter selected.
F	Module/Frame Labels and Selected Output Channel Label	This area of the screen displays the frame and module labels and the selected output label.
G	Low Output Frequency Range (Selected)	The lowest frequency output of the crossover. This output channel is the currently selected crossover filter, identified by light green shading. A solid white line identifies the frequency response of this output channel.
H	Mid Output Frequency Range	The passband crossover that is currently not selected, as identified by dark green shading.
I	High Output Frequency Range	The highest frequency output of the crossover. For a two-way module, the **Xover** screen displays two crossover channels instead of three. An additional EQ tab labeled Aux is available on two-way modules.
J	Crossover/Filter Point	An X marks the frequency at which the output filters cross over. Parametric filter points are also identified by a red (selected) or yellow (not selected) X. Only filter points/filter boxes for the selected output are displayed.
K	Crossover Selector	This is used to change the crossover frequency and to select the side of the crossover you wish to affect. Light green denotes the selected half, and dark green is not selected. When a PEQ filter is selected, the crossover selector changes to the blue filter shape tool.
L	Crossover Menu Button Bar	The functions and submenus available on the Xover page are described in the following sections.

5.3.1 Using the Highpass Filter (HPF Enable)

The highpass filter filters all frequencies below the specified frequency. Input HPF and Low Output HPF are available. Input HPF affects all output channels; Low Output HPF affects only the lowest output of the module. These two different modes of operation are provided

in order to satisfy the requirements of various loudspeaker manufacturers' required signal-processing configurations.

To set the Low Output HPF:

1. Tap **HPF Enable**, then tap **HPF Select**.
2. Select a filter from the scroll bar (24 dB or less).
3. Tap **HPF Set**, then **Yes** to the warning message.

To change the HPF to affect all outputs (Input HPF):

1. Tap **Crossover Functions**, then **HPF Functions**.
2. Tap **Input HPF**.

While in this mode, move the HPF center frequency, and note how it affects all outputs of the module.

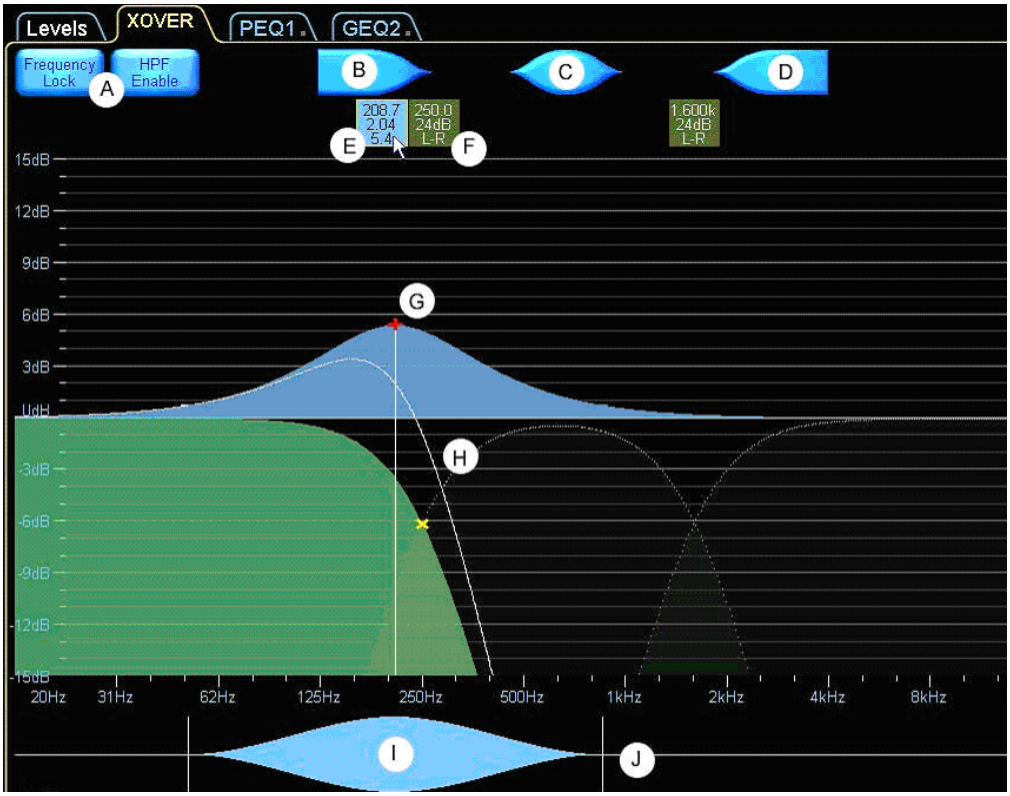
Note: The center frequency of the HPF can be set to a minimum of 10 Hz using the Filter Edit function.

5.3.2 Using PEQ Filters on the Xover Screen

The **Xover** screen provides low-shelf (B), parametric (C), and high-shelf (D) filters to shape the audio from each output as required. When used on the **Xover** screen, the parametric EQ filters affect only the selected output.

Note: Only the PEQ filter points and filter boxes of the selected output are displayed. To select an output, tap the relevant green filter box and toggle between outputs using the crossover tool. The selected output name is displayed in red text at the top right of the **Xover** screen.

The following screen shows a parametric filter used to shape the sound from output 1, the first output of module A, which is the currently selected module. Letter-labeled points on the screen are use in the subsequent instructions.



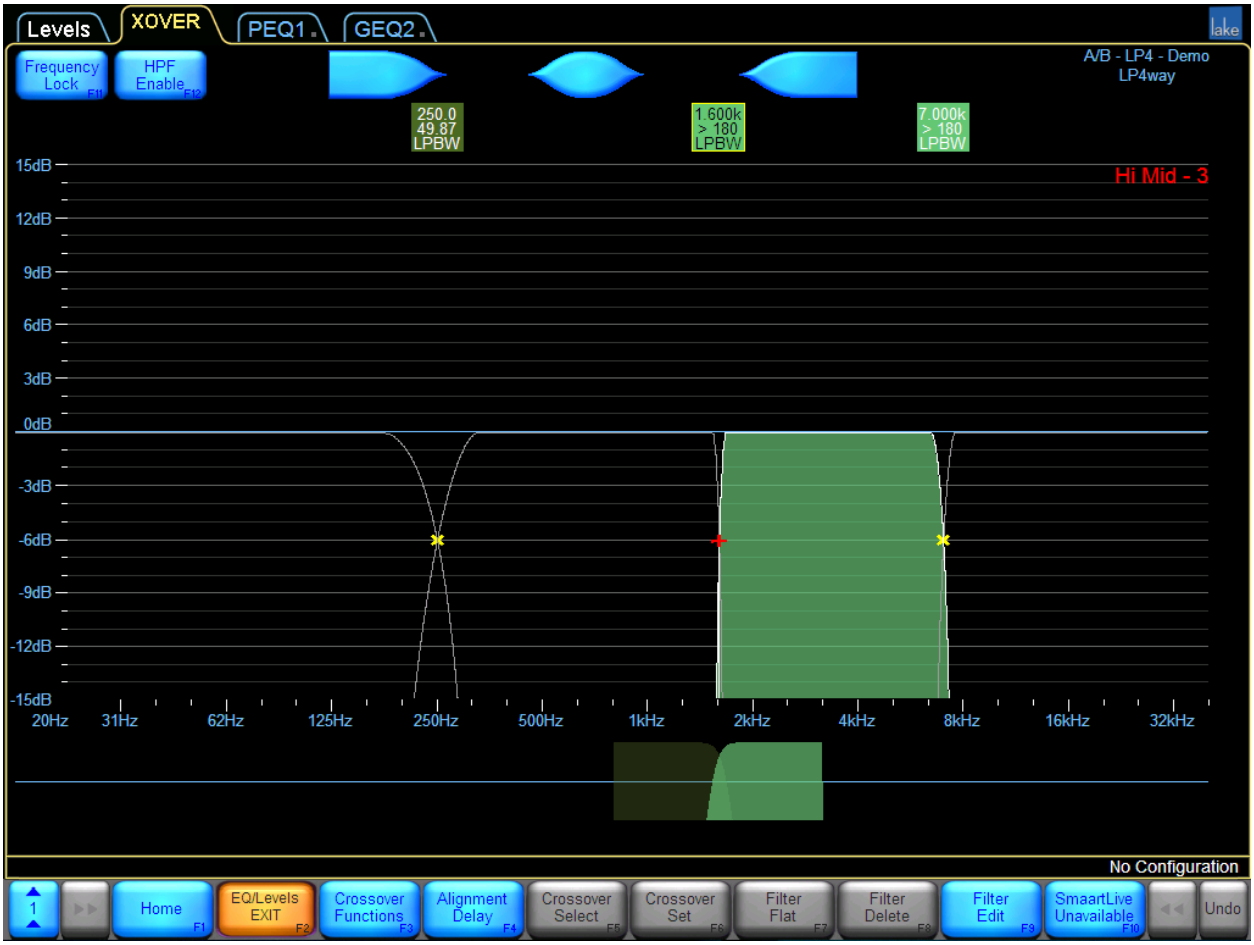
Although this parametric filter crosses the range used by all outputs, it affects only the range of the selected output. The curved white line identifies the effect the parametric filter has on output 1.

To add parametric EQ to an output:

1. Tap the required crossover filter box (F) to select the crossover.
2. Use the crossover selector to select the required output of the crossover (light green equals selected).
3. Tap an **EQ filter** (B, C, or D), and tap again in middle of screen.
4. Boost/cut the frequency gain by dragging the filter point (G) up/down.
5. Adjust the frequency by dragging the filter point (G) left or right. If **Frequency Lock** (A) is active (orange), you cannot change the frequency by dragging the filter point. Either deactivate **Frequency Lock** or use the EQ Tool (I) to change the frequency.
6. Adjust the bandwidth by dragging to the left or right of the shape tool (J).

5.3.3 Linear Phase Crossovers

The linear phase crossover modules provide steep crossovers without phase distortion. The following example shows the **Xover** screen for a Linear Phase Brick Wall 4-Way module (LP4way).



While most of the button-bar functions are the same, some **Xover** menu options and functions are different for linear phase modules. The differences are identified in the sections that follow.

5.3.4 Crossover Functions

Crossover Functions provides a submenu containing the following functions:

HPF/LPF Functions

- **HPF/LPF Func Exit**—Exits this menu and returns to the **Crossover Functions** menu.
- **Input HPF (Contour only)**—Sets the overall module HPF to affect all output channels for the module (depending on the frequency of the HPF and outputs).

- **Low Output HPF (Contour only)**—The Low Output HPF setting affects only the lowest output channel of the selected module.
- **HPF Enable**—Enables/disables the HPF for the selected module.
- **LPF Enable**—Enables/disables the LPF on the highest output channel for the selected module.

Note: **Input HPF** and **Low Output HPF** buttons are disabled for the Linear Phase Brick Wall 4-Way module. The LP4way HPF is fixed to Input HPF. All other module types, including Linear Phase 2- and 3-Way modules, provide the HPF switching option.

Crossover Hide

Available only in Designer Mode. When enabled (orange), the crossover page will be hidden when the module is locked, or after exiting from Designer Mode.

Crossover View Only

Available only in Designer Mode. When enabled (orange), the crossover page will be set as view only when the module is locked, or after exiting from Designer Mode.

EQ Preferences

This provides a submenu containing options regarding the view of the EQ scale.

Crossover Copy

Copies all crossover and EQ settings from the selected Xover or HPF/LPF page.

Crossover Paste

Active only when a crossover or HPF/LPF page has previously been copied and the current module is the same type.

A crossover can only be pasted to a module of the same number of channels and the same type. For example, a Classic 3-Way crossover can be pasted into another Classic 3-Way crossover, the HPF/LPF of a Mesa EQ module can only be pasted onto another Mesa EQ HPF/LPF page, and a Classic 4-Way crossover cannot be pasted into a Linear Phase Brick Wall 4-Way.

Note: The crossover copy and paste functions transfer only the filter settings for the crossover and HPF/LPF (Contour) or HPF/LPF only (Mesa EQ). All levels and input EQ (PEQ/GEQ) will not be affected on the destination module.

5.3.5 Crossover Split/Crossover Combine/Alignment Delay

This button's label depends on the state of the currently selected crossover and the module type (Classic equals Split/Combine; linear phase equals Alignment Delay).

Crossover Split

The label reads **Crossover Split** when a filter box is selected for a Classic crossover that is currently combined. This function separates the HPF and LPF of a Classic crossover, enabling independent adjustment of the crossover frequency and type.

To split a crossover, tap a crossover filter box, then tap **Crossover Split**.

Note: Crossover Split is not applicable for linear phase crossovers.

Crossover Combine

The label reads **Crossover Combine** when a filter box is selected for a Classic crossover that is currently split. This function joins the separated Classic crossover filters together based on the frequency and type of the currently selected filter.

To combine a previously split crossover, select the crossover filter box you wish to use, then tap **Crossover Combine**.

Note: Crossover Combine is not applicable for linear phase crossovers.

Alignment Delay

A linear phase response requires considerable processing; the Alignment Delay function allows a linear phase response to be used in different circumstances depending on the maximum delay that can be permitted in conjunction with the crossover slope.

Steeper low-frequency linear phase crossovers can be calculated with a longer alignment delay. If a steep low-frequency linear phase crossover is not required, a shorter alignment delay can be utilized.

The label on this button reads **Alignment Delay** for linear phase crossovers, and is not applicable for Classic crossovers or other module types.

To change Alignment Delay settings:

1. Tap **Alignment Delay**. The currently selected delay setting is highlighted in orange.
2. Tap the required delay setting. A shorter alignment delay equals a shallower linear phase crossover transition band slope. A longer alignment delay equals a steeper linear phase crossover transition band slope.

LP2way and LP3way modules use different Alignment Delay settings to the LP4way. Table 5-6 shows the highest and lowest frequencies available for the Linear Phase Brick Wall 2-Way/3-Way, along with associated rolloff per octave at these settings.

Table 5-6 Linear Phase Brick Wall 2-Way/3-Way

Alignment Delay	Lowest Frequency	dB/Octave	Highest Frequency	dB/Octave
1.25 ms	500 Hz	13.61	12 kHz	93.37
2.50 ms	250 Hz	11.04	12 kHz	93.37
5 ms	125 Hz	11.01	12 kHz	93.37
10 ms	62.5 Hz	11.03	12 kHz	93.37
20 ms	32.5 Hz	10.84	12 kHz	93.37
40 ms	32.4 Hz	14.47	12 kHz	93.37

Table 5-7 shows the highest and lowest frequencies available for the Linear Phase 24 dB/octave 2-Way/ 3-Way.

Table 5-7 Linear Phase 24 dB/Octave 2-Way/3-Way

Alignment Delay	Lowest Frequency	Highest Frequency
1.25 ms	1.03 kHz	6.022 kHz
2.50 ms	515 Hz	6.022 kHz
5 ms	258 Hz	6.022 kHz
10 ms	129 Hz	6.022 kHz
20 ms	32.5 Hz	6.022 kHz
40 ms	31.6 Hz	6.022 kHz

Table 5-8 shows the highest and lowest frequencies available for the Linear Phase 48 dB/octave 2-Way/3-Way.

Table 5-8 Linear Phase 48 dB/Octave 2-Way/3-Way

Alignment Delay	Lowest Frequency	Highest Frequency
1.25 ms	1.03 kHz	8.501 kHz
2.5 ms	515 Hz	8.501 kHz
5 ms	258 Hz	8.501 kHz
10 ms	129 Hz	8.501 kHz
20 ms	32.5 Hz	8.501 kHz
40 ms	31.6 Hz	8.501 kHz

Table 5-9 shows the highest and lowest frequencies available for the Linear Phase Brick Wall 4-Way (LP4way), along with associated rolloff per octave at these settings.

Table 5-9 Linear Phase Brick Wall 4-Way

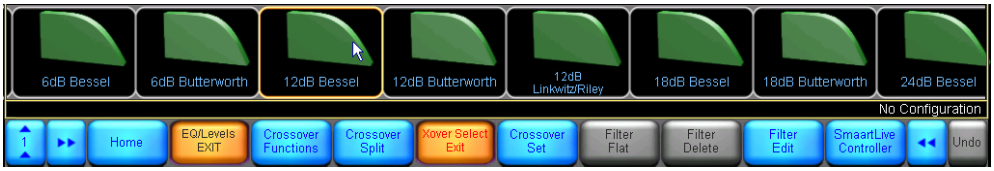
Alignment Delay	Lowest Frequency	dB/Octave	Highest Frequency	dB/Octave
3.15 ms	220 Hz	13.61	16 kHz	>180
6.29 ms	110 Hz	13.61	16 kHz	>180
12.58 ms	62.5 Hz	13.56	16 kHz	>180
25.17 ms	62.5 Hz	24.58	16 kHz	>180

5.3.6 Crossover/HPF/LPF Select

Crossover Select

This button reads **Crossover Select** and is active only when a crossover filter box is selected on a Classic crossover or a Linear Phase 2-Way/3-Way. This function is not available for the Linear Phase 4-Way module.

Tap **Crossover Select** to display a scroll bar containing available crossover types. For a Classic crossover, the following scroll bar displays.



For a Linear Phase 2-/3-Way crossover, the following scroll bar displays.

To change the crossover type:

1. Tap a crossover filter box, then tap **Crossover Select**.
2. Drag the scroll bar left or right, and tap the desired crossover.
3. Tap **Crossover Set**, then **Yes** to the warning message.

HPF Select

This button reads **HPF Select** and is active only when a highpass filter box is selected. Follow the process described for Crossover Select to set the highpass filter.

LPF Select

This button reads **LPF Select** and is active only when a lowpass filter box is selected. Follow the process described for Crossover Select to set the lowpass filter.

Note: The LPF is enabled via the **HPF/LPF Functions** menu.

5.3.7 HPF Set/LPF Set/Crossover Set/Filter Bypass/Filter Insert

This button has various states depending on the status of the selected filter. For further details, refer to Section 5.3.6.

HPF Set

The button reads **HPF Set** when a highpass filter has been selected from the **HPF Select** scroll bar.

LPF Set

This button reads **LPF Set** when a lowpass filter has been selected from the **LPF Select** scroll bar.

Crossover Set

This button reads **Crossover Set** when a crossover filter has been selected from the **Crossover Select** scroll bar.

Note: Not applicable for the Linear Phase Brick Wall 4-Way crossover.

Filter Bypass/Filter Insert

This button displays **Filter Bypass** when a parametric filter is selected, or when a crossover filter has been split.

For parametric EQ filters, select the filter box and tap **Filter Insert/Filter Bypass** to activate/deactivate the selected filter.

A crossover HPF/LPF filter can be disabled by splitting the crossover and tapping **Filter Bypass, followed by OK on the warning confirmation dialog.**

Note: Linear phase crossovers, or combined Classic crossovers, cannot be bypassed. To bypass the module's overall HPF or LPF, toggle the **HPF Enable/LPF Enable** button.

5.3.8 Filter Flat

The **Filter Flat** button is active only when a PEQ filter is selected. The function is inactive if a crossover is selected.

Tap **Filter Flat** to set the filter gain to zero and leave frequency/bandwidth unchanged.

5.3.9 Filter Delete

The **Filter Delete** button is active only when a PEQ filter is selected. The function is inactive if a crossover is selected.

Tap **Filter Delete** to remove the selected PEQ filter from the overlay.

5.3.10 Filter Edit

Tap **Filter Edit** to manually enter values for a selected filter using the onscreen (or an external) keyboard. The values available for adjustment depend on whether a crossover or PEQ filter is selected.

Table 5-10 Filter Edit Values

Filter	Editable Values
Crossover/HPF/LPF	Frequency (Hz)
PEQ	Gain (dB), frequency (Hz), and width (octave)

To manually edit a filter:

1. Tap the filter box, then tap **Filter Edit**.
2. Tap the value to edit at the top of the screen (highlighted in blue).
3. Enter the value using the onscreen keyboard (or an external keyboard), and tap **OK**.
4. Tap **Filter Edit** again to exit this mode.

5.3.11 Analyzer Bridge/Analyzer Unavailable

Please refer to Section 5.2.20 for details on this function.

5.4 Auxiliary Output Channels

The Contour processor provides various options to configure channels as auxiliary outputs. Up to 12 individually configured auxiliary outputs can be created. The Auxiliary Output module files allow full-bandwidth custom settings to be configured by the user. Independent **Aux** tabs are provided for each output channel instead of a unified **Xover** tab. These **Aux** tabs are in addition to the parametric and graphic EQ settings that still apply to all outputs for the module.

Because a different process is used to calculate output-specific EQ, the Mesa filter is not available. However, in addition to low-shelf, high-shelf, and parametric filters, the Auxiliary Output modules provide both lowpass and highpass filters. In Designer Mode, all-pass filters are also available.

Table 5-11 shows the available Auxiliary Output module types and the modules with which these may be used in conjunction.

Table 5-11 Auxiliary Output Module Uses

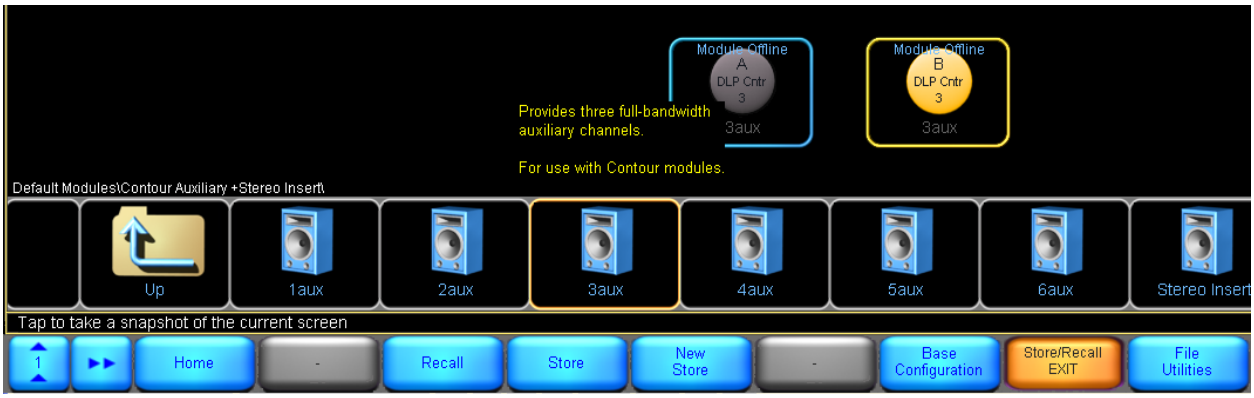
Module	Available Uses
1 Auxiliary Output	Module B/D only where module A/C contains a Classic 5-Way (CL5way) module.
2 Auxiliary Outputs	Any module. The other modules of the frame may contain any Classic or Linear Phase module that uses two or three output channels.
3 Auxiliary Outputs	Any module. The other modules of the frame may contain any Classic or Linear Phase module that uses two or three output channels.
4 Auxiliary Outputs	Module A/C. An option to load either a Classic 2-Way or the 2 Auxiliary Outputs modules is provided when loading the 4-Auxiliary Outputs module.
5 Auxiliary Outputs	Module A/C. Module B is loaded with the 1 Auxiliary Output module.
6 Auxiliary Outputs	Module A/B or C/D. Two modules are used for this module type.
Classic 2-Way + 1Auxiliary (CL2w+1a)	This file may be loaded into any Contour module. The other modules of the frame may contain any Classic or Linear Phase module that uses two or three output channels.

Module	Available Uses
Classic 3-Way + 1Auxiliary (CL3w+1a)	This file may be loaded into module A or C only. The other modules of the frame may contain any Classic or Linear Phase module that uses two or three output channels.
Linear Phase Brick Wall 2-way + Auxiliary Output (LP2w+1a)	This file may be loaded into any Contour module. The other modules of the frame may contain any Classic or Linear Phase module that uses two or three output channels.

5.4.1 Using Auxiliary Outputs

To configure a module for output-specific EQ, first load an Auxiliary Output file into a module.

1. From **Home**, tap **Modules**.
2. Place module **A** of a frame on the **Main** page, or select an existing module.
3. Tap **Module Store/Recall**.
4. Select an Auxiliary Output file from the scroll bar, and tap **Recall**.
5. Tap **Yes** for both warning messages.



6. After loading an Auxiliary Output module file, access EQ/Levels for this module by tapping **Store/Recall Exit**, then tap **EQ/Levels**.

5.4.2 Adding Output-Specific EQ

The available overlays for the **3 Auxiliary Outputs** module are shown here:

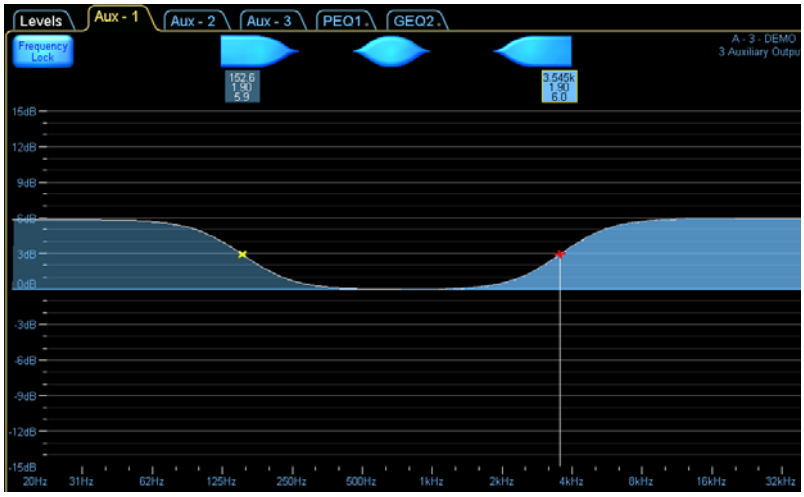
The Levels section of the Dolby Lake Controller is identical to that for other modules, as is the functionality for PEQ1 and GEQ2. Please refer to Section 5.1 for further information.

The **Xover** tab is not displayed because it is not relevant for this module type. The **Xover** tab will be present for the Classic 2-Way + 1 Auxiliary Output (CL2w+1a) module.

Three additional **Aux** tabs are present, providing individual highpass, lowpass, and EQ filters for each output.

1. Tap **Aux -1** to select the **Auxiliary Output** tab for output 1.
2. Add a low and a high-shelf filter.

The screen should look similar to the following figure:

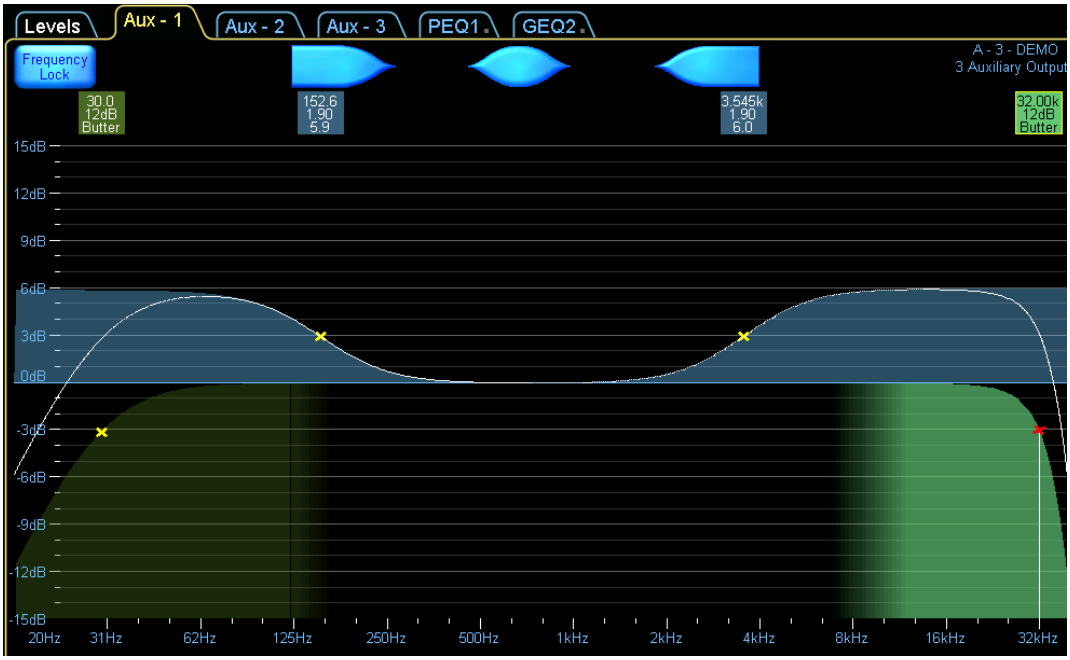


EQ added to an **Aux** tab affects only the associated output. Module and group PEQ and GEQ still affect all outputs of the module.

5.4.3 Highpass and Lowpass Filters

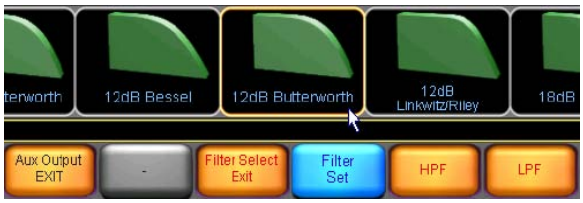
The highpass and lowpass filter controls are located under the **Aux Output Functions** submenu.

With the **Aux-1** tab selected, tap **Aux Output Functions**. Tap **HPF Enable,** then **LPF Enable** to activate both filters.



To adjust the slope of these filters:

1. Tap **Filter Select**. A scroll bar appears displaying available **HPF/LPF** types.
2. Drag the scroll bar or use the ◀◀ and ▶▶ buttons to view available filters.
3. Select the **24dB Linkwitz/Riley** filter from the scroll bar.
4. Tap **Filter Set** to activate this filter, then **Yes** to the warning message.



Note: To protect loudspeaker drivers, the audio output for the affected channel is muted momentarily while the settings are changed.

5. Select the HPF by tapping its filter box located top left of the screen.
6. Select the **18dB Butterworth** filter from scroll bar.
7. Tap **Filter Set**, then **Yes** to the warning message.
8. Tap **Aux Output Exit** to return to the **EQ/Levels** menu.

Note: Steep highpass and lowpass filters (48 dB) require more EQ resources than shallower slopes (6 dB).

5.4.4 Auxiliary Output Menu Options

The menu options shown in the following figure are available when an EQ filter is selected on an Auxiliary Output in the EQ/Levels section of an Auxiliary Output module.

A summary of the functions relevant to Auxiliary Outputs is shown in Table 5-12; many are identical to those used on the **EQ** and **Xover** screens.

Table 5-12 Auxiliary Output Menu

Button	Function
Home	Returns to the **Home** menu.
EQ/Levels Exit	Returns to the **Home** menu or to the **I/O Config** page if the screen was accessed via the **I/O Config** page interactive block diagram.
Aux Output Functions	Provides EQ preferences, highpass and lowpass filter options, and overlay copy/paste (and overlay access controls in Designer Mode).
Aux Output Flat	Deletes all EQ, HPF, and LPF filters from the selected auxiliary output channel.
Filter Bypass/Filter Insert	Bypasses or inserts a selected EQ filter (not applicable to highpass and lowpass filters).
Filter Flat	Resets the gain of the selected EQ filter to zero; frequency and bandwidth are unchanged (not applicable for highpass and lowpass filters).
Filter Delete	Deletes the selected EQ filter (not applicable for highpass and lowpass filters).
Filter Edit	Allows keyboard entry of gain, frequency, and bandwidth values for EQ filters and frequency only for highpass and lowpass filters. Tap the required value at the top of the screen (highlighted in blue) to edit using the onscreen keyboard (or an external keyboard).
Analyzer Bridge /Analyzer Unavailable	This button provides further submenus for the Analyzer Bridge. If an approved analyzer and/or the Analyzer Bridge are not running on the network, this button reads **Analyzer Unavailable**. Please refer to the Analyzer Bridge user's manual for further information, or visit www.dolby.com/livesound for further details.

The functions shown on the following button bar are described in

Table 5-13.

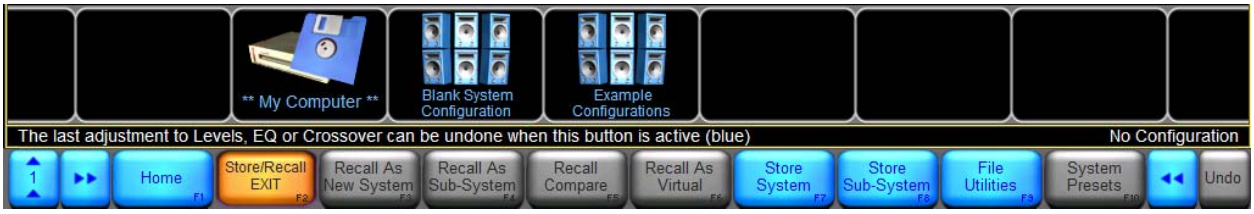
Table 5-13 Auxiliary Output Buttons

Button	Function
Home	Returns to the **Home** menu.
Aux Output Properties	Provides a submenu containing EQ Preferences. Access control functions (Aux Output Hide and Aux Output View Only) are available only in Designer Mode; refer to Chapter 18 for further details.
Aux Output Exit	Returns to the main EQ/Levels menu.
Filter Select	When selected (orange), a scroll bar is displayed with available highpass and lowpass filters. Available only when a highpass or lowpass filter is active and selected; not applicable to EQ filters.
Filter Set	This function is available after a highpass or lowpass filter has been selected from the Filter Select scroll bar.
HPF Enable	The highpass filter is disabled when this button is blue, and enabled when orange.
LPF Enable	The lowpass filter is disabled when this button is blue, and enabled when orange.
Aux Output Copy	Tapping this button copies the settings of the currently selected output.
Aux Output Paste	This button is active only after Aux Output Copy has been used, and will overwrite the selected auxiliary output with the settings that were previously copied. Auxiliary Outputs can be copied and pasted within or between modules, but the data cannot be pasted on Xover, PEQ, or GEQ screens; the destination channel must be an Auxiliary Output.

System Store and Recall—Menu Reference

The Dolby® Lake® Controller allows the user to store and recall complete system configurations. This enables the same Dolby Lake Processors to be used in entirely different situations, as their complex configurations can be changed within seconds.

From the **Home** menu, tap **System Store/Recall**. The button bar displays the following options, and a scroll bar also appears containing files and folders.



The first icon on the system scroll bar is labeled ****My Computer****. Selecting this and tapping **Open** will allow you to navigate to folders and files on your hard drive or any removable disk.

The other files shown at the root of this directory are the system configuration files stored from within the Controller software.

If there are many folders or files, drag the scroll bar to the left or right, or tap the ◀◀ or ▶▶ buttons. Most options on the button bar appear gray and are inactive until a folder or file is selected on the scroll bar.

6.1 Shortcut to Data/User Folder

Software installation of the Dolby Lake Controller places a shortcut in:

Start → Programs →Dolby Lake Controller → User Data Files

This shortcut can be used to open the Microsoft® Windows® folder containing your system and module files.

6.2 Recall as New System—Open

The function and label of the button depend on whether a folder or file is selected. The button is inactive when neither a file nor folder is selected.

The button is labeled **Open** when a folder is selected.

To open a folder:

1. Tap the desired folder icon. (The selection is indicated by a yellow border.)
2. Tap **Open**. Double-tapping the folder icon also opens the folder.

The button is labeled **Recall as New System** when a file is selected; recalling the file will clear all current settings from the Controller and load the details stored in the file into the relevant online processors.

To recall a system configuration file as a new system:

1. Tap the desired file to recall.
2. Tap **Recall as New System**.
3. Confirm the action by tapping the **Yes** button on the warning message.

Note: Recalling a system configuration file as a new system overwrites the current settings in the associated Dolby Lake Processors and will affect audio processing. Presets stored in hardware Processors are not overwritten when a system configuration file is recalled from the Dolby Lake Controller.

6.3 Recall as Subsystem

The **Recall as Subsystem** button enables you to add all elements of a system configuration file to the current configuration. You can save or reload specific parts of your configuration for reuse in a different show.

This function will not automatically arrange icons so they do not overlap. Be careful to locate icons in the different subsystem files that you create so when loaded they are in different locations or pages. This function adds the modules, super modules, and groups to your current configuration (or replaces the data if the processor is currently in use).

6.4 Recall Compare

The **Recall Compare** button enables you to compare a system configuration file to the current system configuration stored in the Dolby Lake Processors. This button is active only when a file is selected.

To compare the current configuration with one stored in a file:

1. Tap **System Store/Recall**.
2. Navigate to the file you wish to compare.
3. Tap the file icon to select it.
4. Tap **Recall Compare**.
5. Confirm the action by tapping the **Yes** button in the warning message.

This function can help identify any changes that have been made since a file was loaded. Modules with altered data are identified by a red disc behind their normal icon (indicating the Dolby Lake Controller is out of sync with the Processor).

Note: **Recall Compare** does not overwrite any data in the Processors. Audio will not be changed until you tap the button labeled **Use data in controller**.

6.5 Recall as Virtual

The **Recall as Virtual** button enables you to work on a system file when no physical units are connected. All frames are seen as virtual. Once the system has been designed, the virtual frames can be replaced by physical frames.

This function adds the data from the selected file (all modules and groups) to the current system configuration as virtual modules.

6.6 Store System

The **Store System** button stores the entire system configuration. If a file is selected on the scroll bar, the name of that file will appear in the onscreen keyboard, allowing the file to be overwritten or for a file name variation to be used.

1. Tap **Store System**.
2. Confirm the action by tapping the **Yes** button in the warning message.

Note: If the selected file is set to read only, this function is inactive (gray).

6.7 Store Subsystem

The **Store Subsystem** button stores the selected modules, super modules, and groups as a subsystem. Only the data from the selected modules (including any group assignments) will be stored in the file.

1. Navigate the file system, and tap the desired destination folder to select it.
2. Select the required modules, super modules, and group icons.
3. Tap **Store Subsystem**.

4. Enter the file name using the onscreen keyboard (or an external keyboard).
5. Tap **OK**.

The scroll bar displays the new file.

6.8 File Utilities

This button provides a submenu containing further functions that manage files and folders from within the Dolby Lake Controller.

6.8.1 Open

This button is active only when a folder is selected. Tap **Open** to open the selected folder.

6.8.2 Read Only

This function protects important files from being accidentally overwritten or deleted and is active only when a file is selected. The currently selected file's status is identified by the color of the **Read Only** button:

- Orange—The selected file is set to Read Only.
- Blue—The selected file is not set to Read Only.

To change the status of a file:

1. Tap a file from the scroll bar to select it.
2. Tap **Read Only** to toggle the function on (orange) and off (blue).

6.8.3 Rename

This button changes the name of a file or folder.

1. Tap the file/folder from the scroll bar.
2. Tap **Rename**.
3. Enter the new name using the onscreen keyboard (or an external keyboard).
4. Tap **OK**.

6.8.4 Delete

This button is active only when a file or folder is selected. When a file is selected, this function is available only if the file is not set to Read Only.

To delete a file or folder:

1. Tap a file or folder to select it.
2. Tap **Delete**.

3. Confirm the action by tapping **Yes** in the warning message.

Note: Deletion of a file is permanent and cannot be restored using the Undo function.

6.8.5 New Folder

This button creates a new folder in the current directory.

To create a new folder:

1. Navigate to the directory where the new folder will reside.
2. Tap **New Folder**.
3. Enter the new folder name using the onscreen keyboard (or an external keyboard).
4. Tap **OK**.

6.9 System Presets

The System Presets function allows entire system configurations to be stored in a network of Dolby Lake Processors. This enables fast retrieval and switching of configurations as there is minimal data being sent between the Controller and Processors.

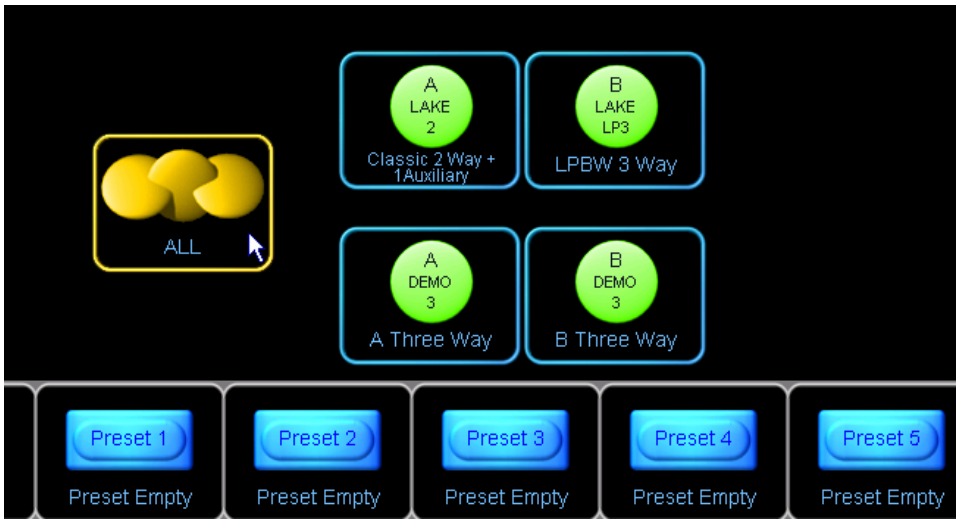
System presets are stored in each Processor and retrieved either via the Controller software (described in this section) or via the front panel of the Processor.

6.9.1 Storing a System Preset in Multiple Processors

To store the current system configuration in multiple Dolby Lake Processors:

1. Set up the configuration as required.
2. From **Home**, tap **System Store/Recall,** then tap **Store System.** This ensures that you have a backup of the exact data, which will be stored as a preset in the hardware.
3. Tap **System Presets**.
4. Tap the group/module icons that you wish to be stored as part of the system preset. (Icons turn green to indicate selection.)

For example, if you wish for all frames in your current system configuration to be stored as a system preset, tap a module from each frame, or if you are using groups, tap a group that contains all frames (as shown in the following figure). To deselect a frame or group, tap the icon again.



5. After making the desired module selections:
   - Tap on an empty preset location from the scroll bar (for example, **Preset 1**). The button labeled **Store With New Name** will be activated.
   - Tap **Store With New Name**.
   - Enter a preset name using the onscreen keyboard (or an external keyboard), and tap **OK**.

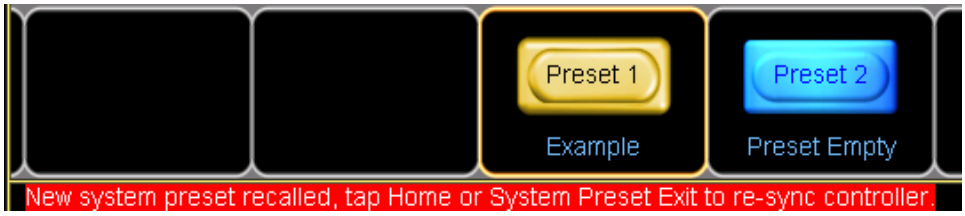
6.9.2 Recalling a System Preset into Multiple Processors

To recall a system preset into multiple Dolby Lake Processors:

1. From **Home**, tap **System Store/Recall**, then tap **System Presets**.
2. Select each frame you wish to recall the preset into by tapping module or groups icons. (Selected frames are identified by green icons.)
3. Tap the required preset on the scroll bar.
4. Tap **Recall** and then **OK** to the warning messages.

The audio will change quickly, but the Controller will not resync with the network until you exit the **System Preset** menu. A flashing warning message confirms this.

This enables quick comparison between different configurations without the need to synchronize the Controller after each preset is recalled.



The system configuration name of the preset last recalled will flash at the bottom right of the screen.

Once the required system preset has been recalled, tap **Home** or **System Preset Exit** to synchronize the Controller with the new settings that have been loaded into the Processors.

Note: Individual frame presets can also be recalled from the front panel of each Processor. If the preset recall changes the configuration of the selected Dolby Lake Processor between Contour™, Contour/Mesa, and Mesa, a warning message will be displayed and the modules will be returned to the scroll bar.

6.9.3 Quick System Preset Recall and Comparison

Quick Recall mode instantly recalls each system preset into all selected frames when the preset location on the scroll bar is tapped. No confirmation messages are displayed while in this mode, and all other preset functions are disabled.

To enable fast recall/comparison of system presets:

1. From **Home**, tap **System Store/Recall**, then tap **System Presets**.
2. Select each frame you wish to recall the preset into by tapping module or groups icons. (Selected frames are identified by a green icon.)
3. Tap **Quick Recall.** (Orange equals active; blue equals inactive.)
4. Tap a preset location from the scroll bar.
5. Repeat the previous step to compare with other system presets.

Note: No confirmation or warning messages are displayed while in Quick Recall mode (except when the preset involves a configuration change as described in the preceding note). Tapping the preset location will immediately load the selected system preset into all selected frames.

6.9.4 Storing over an Existing Preset

Follow the steps shown in Section 6.9.1, but select a system preset location that is already used and tap **Store** instead of **New Store**. The data in the preset location of the selected frames will be replaced by the current system configuration.

6.9.5 Clearing a Preset Location

To clear a system preset location from multiple Dolby Lake Processors:

1. From **Home**, tap **System Store/Recall**, then tap **System Presets**.
2. Select each frame you wish to clear the preset from by tapping module or groups icons. (Selected frames are identified by a green icon.)
3. Tap the preset location that you wish to clear from the scroll bar.
4. Tap **Clear**, then **OK** to the warning messages.

6.9.6 Preset Mismatch

If one or more of the selected frames contains a different configuration in a particular preset location, **Preset Mismatch** displays as the name for that system preset location.

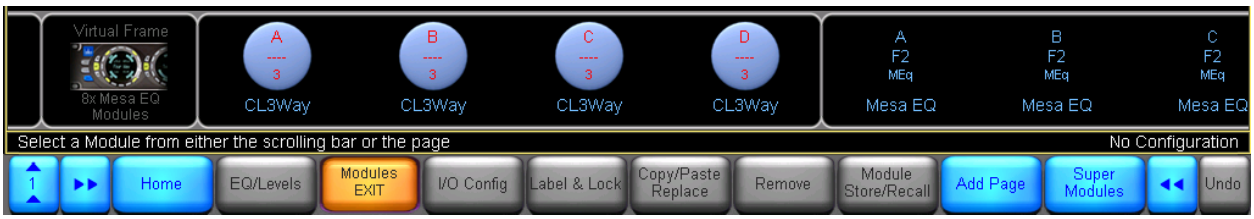
A mismatch occurs if different configurations are stored separately in different Dolby Lake Processors, and these Processors are selected together in the **System Preset** menu.

To correct a Preset Mismatch status, either empty the preset location using the **Clear** function, or use the Store with New Name function to store the data of the currently loaded configuration into all selected frames.

The **Recall** and **Store** buttons will be disabled when a location is selected for multiple frames that contain a Preset Mismatch.

Modules—Menu Reference

From the **Home** menu, tap **Modules**. The **Modules** menu and scroll bar appear as shown below. The scroll bar shows all processors connected to the network.



The scroll bar pictured above displays the following (from left to right):

- A virtual frame icon that is always available for creating entire systems while working offline.
- Four modules of a Dolby® Lake® Processor (configured as Contour™, labeled CL3Way) are available for use.
- The first three modules of a Lake Mesa Quad EQ™ Processor are being used in the current configuration.

If many processors are available, tap and drag the scroll bar to the left/right, or tap the blue ◀◀ or ▶▶ buttons. Most options on the button bar appear gray (inactive) until a module is placed from the scroll bar onto the **Main** page.

Note: The processors are sorted in alphabetical order on the scroll bar by frame name.

7.1 EQ/Levels

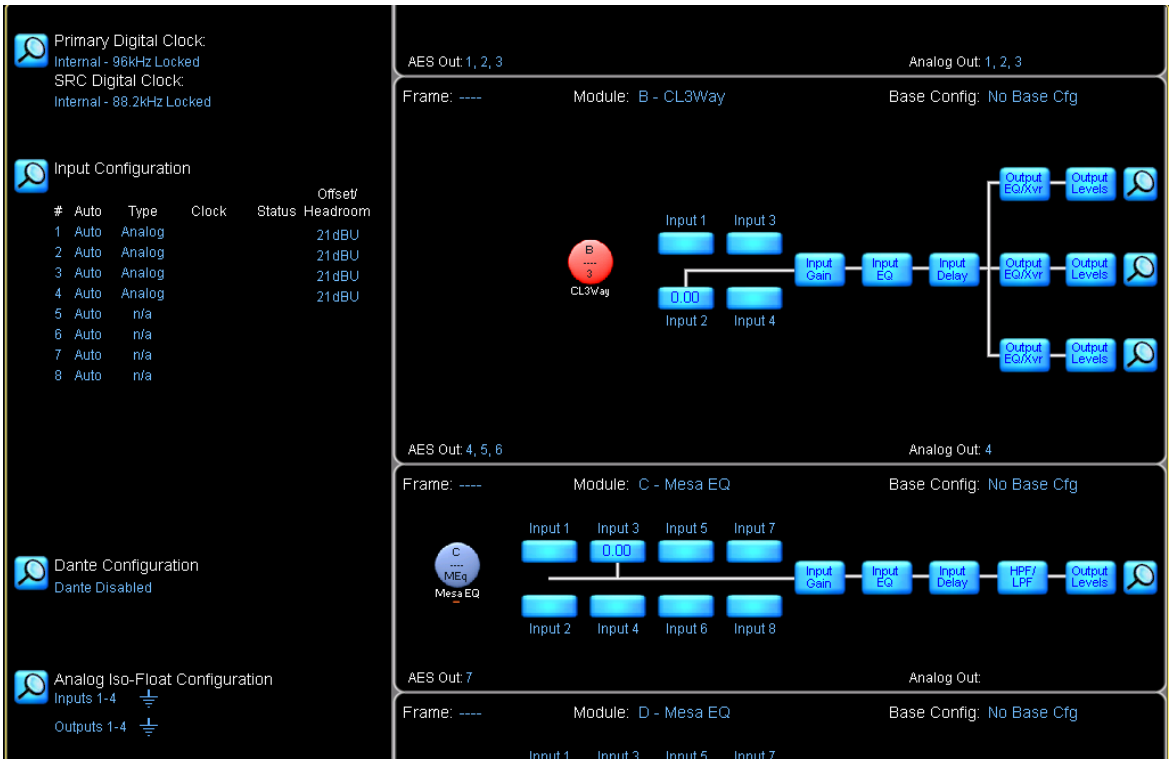
Navigate to the **Modules** menu, and tap the **EQ/Levels** button to display the **parametric EQ**, **graphic EQ**, **Xover**, and **Levels** screens for the selected module. This function is active only when a module has been selected in the work area. For more information, please refer to Section 5.1.

7.2 I/O Config

The **I/O Config** page provides I/O configuration, technical information, input mutes, an interactive signal path that can be used to directly navigate to the Levels/EQ/Xover screens, and the ability to reset or reconfigure a processor.

To view the **I/O Config** page:

1. From **Home**, access the **Modules** menu.
2. Select a module icon in the work area, and tap **I/O Config**. (The **I/O Config** button is active only when a module is selected in the work area.)



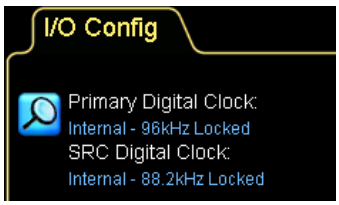
This figure shows the **I/O Config** page for a Dolby Lake Processor configured as a Contour/Mesa hybrid. The sections that follow describe each screen/function available from the **I/O Config** page in further detail.

7.2.1 Digital Clock Configuration

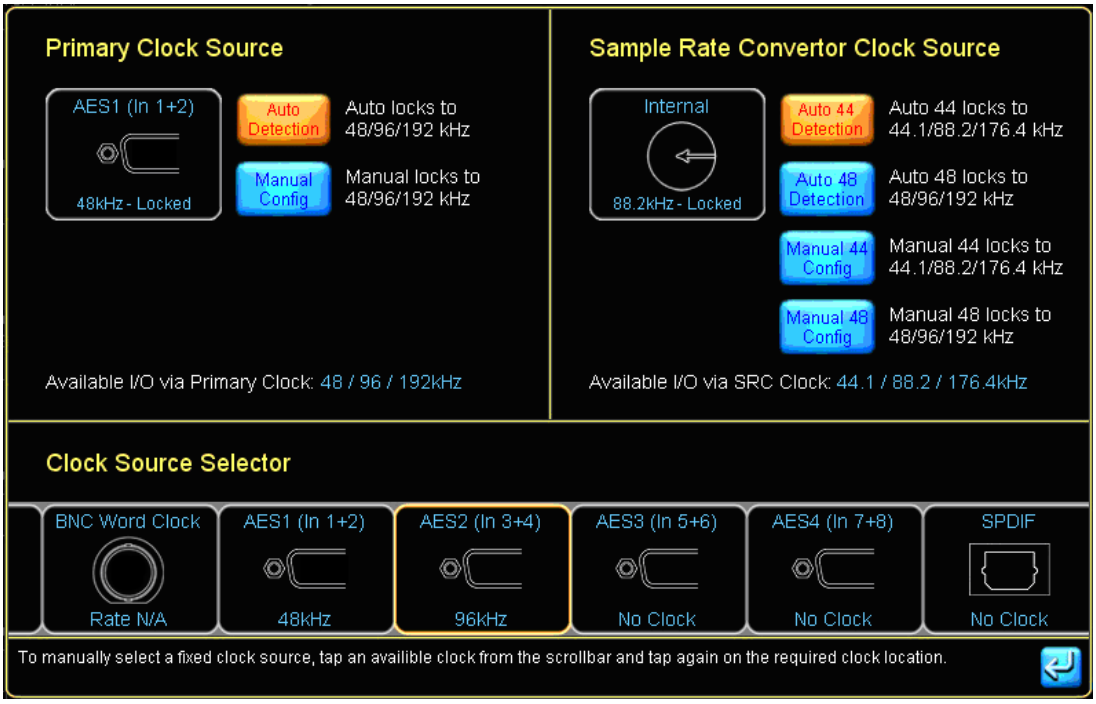
The Dolby Lake Processor provides two digital clocks:

- **Primary Digital Clock**—Locks to a sample rate of 48, 96, or 192 kHz (no sample rate conversion, very low latency).
- **Sample Rate Converter Clock (SRC Clock)**—Locks to 44.1, 48, 88.2, 96, 176.4, and 192 kHz.

To access the **Digital Clock Configuration** window, tap the zoom button located at the top left of the **I/O Config** page:



A pop-up window displays:


Primary Clock Source
AES1 (In 1+2)
48kHz - Locked
Auto Detection
Auto locks to 48/96/192 kHz
Manual Config
Manual locks to 48/96/192 kHz
Available I/O via Primary Clock: 48 / 96 / 192kHz
Sample Rate Convertor Clock Source
Internal
88.2kHz - Locked
Auto 44 Detection
Auto 44 locks to 44.1/88.2/176.4 kHz
Auto 48 Detection
Auto 48 locks to 48/96/192 kHz
Manual 44 Config
Manual 44 locks to 44.1/88.2/176.4 kHz
Manual 48 Config
Manual 48 locks to 48/96/192 kHz
Available I/O via SRC Clock: 44.1 / 88.2 / 176.4kHz
Clock Source Selector
BNC Word Clock
Rate N/A
AES1 (In 1+2)
48kHz
AES2 (In 3+4)
96kHz
AES3 (In 5+6)
No Clock
AES4 (In 7+8)
No Clock
SPDIF
No Clock
To manually select a fixed clock source, tap an availible clock from the scrollbar and tap again on the required clock location.

Auto Detection

By default, the most appropriate digital clocks are automatically detected. The first valid clock in the order of the list shown below is chosen to configure the Primary Clock as 48/96/192 kHz, and the SRC Clock as 44.1/88.2/176.4 kHz.

- BNC Word Clock
- AES1 (In 1+2)
- AES2 (In 3+4)
- AES3 (In 5+6)
- AES4 (In 7+8)
- S/PDIF
- Internal Clock (88.2 or 96 kHz)

If a clock signal is unavailable, or temporarily lost, the automatic detection process chooses the next valid clock source from the list, provided it matches the selected base rate (either

44.1 or 48 kHz). If a valid clock source is detected from a source which is higher on the list than the currently selected source, then the clock will switch to use the higher priority source.

Note: The SRC Clock has two options for automatic clock detection: **Auto 44** and **Auto 48.** These settings provide automatic detection within a particular range of frequencies (either 44.1/88.2/176.4 kHz or 48/96/192 kHz).

Manual Config

For a fixed configuration, it is possible to fix the clock selection independently for each digital clock.

1. Tap the required clock from the Clock Source Selector at the bottom of the **Digital Clock Configuration** window.
2. Tap the icon showing the currently selected clock under the relevant clock heading in the top-left (Primary) or top-right (SRC) sections of the window.

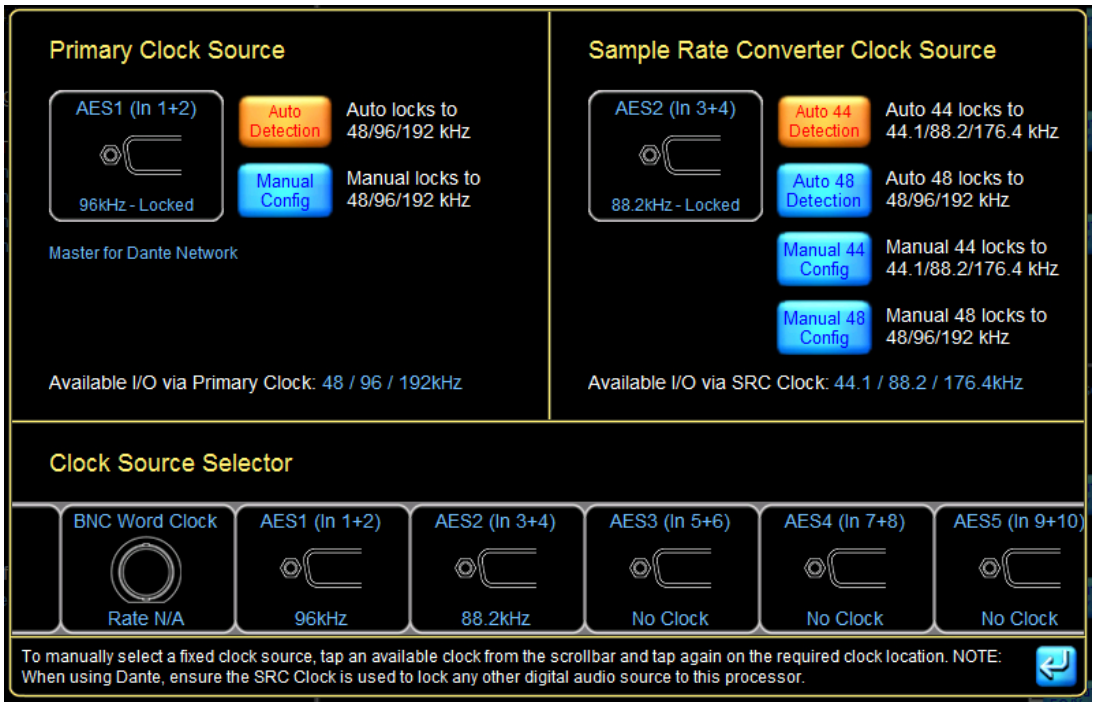
The larger icon in each of the windows shows the selected clock, and the associated text confirms the rates that are available when using this clock for either inputs or outputs.

Dante Clock

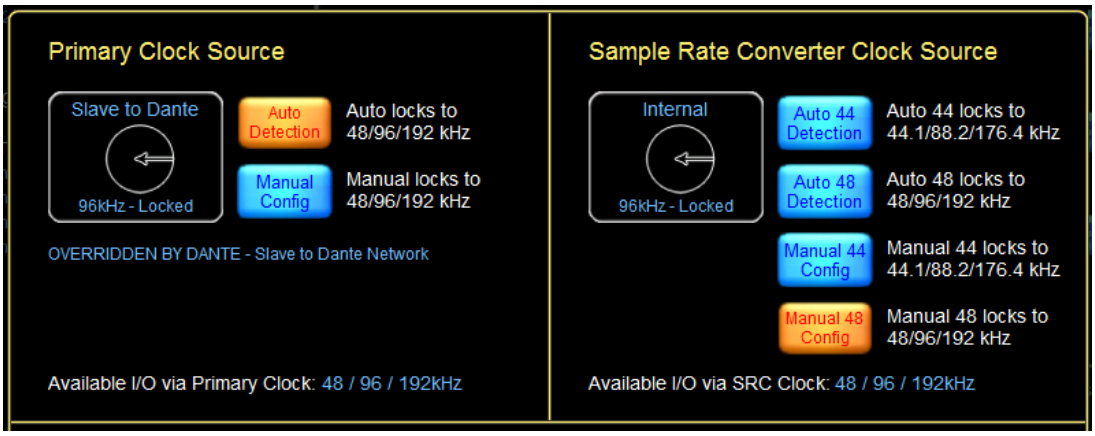
When Dante is enabled on a Dolby Lake Processor, the Primary clock is used for Dante purposes. One processor will be allocated as the Dante Master, and all others will be Dante Slaves. The Dante Master priority follows the same order as Auto Detection, with a processor using BNC Word Clock being chosen over one with an AES signal, and so on.

Where there is no distinguishing feature for a processor to be selected (for example, all processors have a BNC Word Clock connected, or multiple processors have an AES signal), then Dante uses the processor with the lowest Mac Address as a unique distinguishing feature.

The Dante Master may lock to an external clock via the Primary Clock as shown is the example below. If you require another signal type to be locked to the box, use the SRC Clock. The example below shows how two differing AES signals can be connected to one Dolby Lake Processor, with Dante locking to the Primary Clock's AES signal:

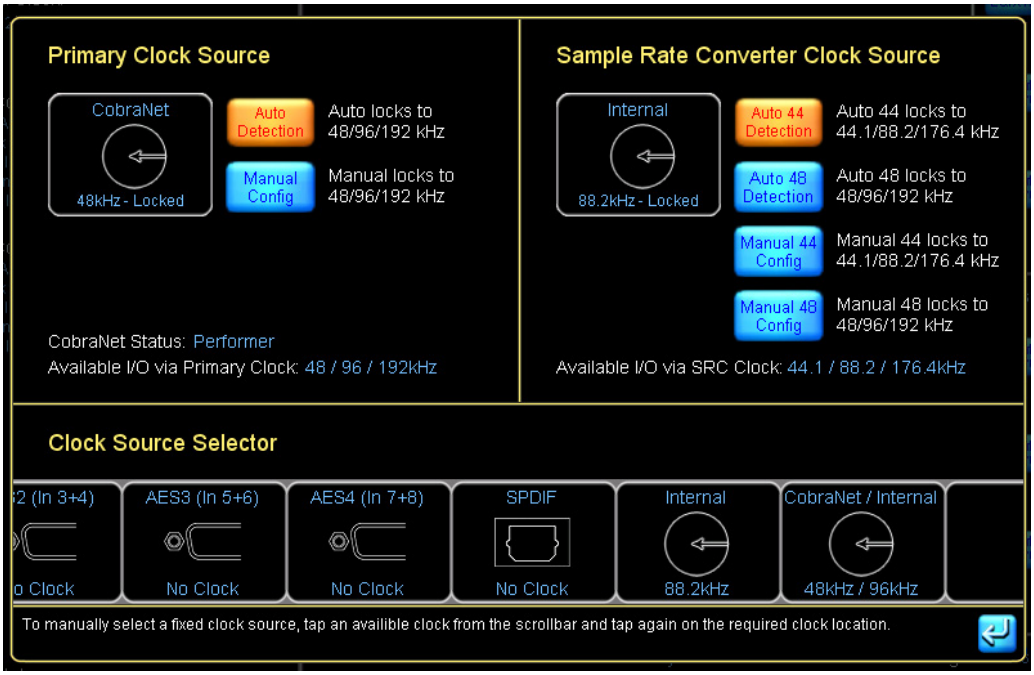

Primary Clock Source
AES1 (In 1+2)
96kHz - Locked
Auto Detection
Auto locks to 48/96/192 kHz
Manual Config
Manual locks to 48/96/192 kHz
Master for Dante Network
Available I/O via Primary Clock: 48 / 96 / 192kHz
Sample Rate Converter Clock Source
AES2 (In 3+4)
88.2kHz - Locked
Auto 44 Detection
Auto 44 locks to 44.1/88.2/176.4 kHz
Auto 48 Detection
Auto 48 locks to 48/96/192 kHz
Manual 44 Config
Manual 44 locks to 44.1/88.2/176.4 kHz
Manual 48 Config
Manual 48 locks to 48/96/192 kHz
Available I/O via SRC Clock: 44.1 / 88.2 / 176.4kHz
Clock Source Selector
BNC Word Clock
Rate N/A
AES1 (In 1+2)
96kHz
AES2 (In 3+4)
88.2kHz
AES3 (In 5+6)
No Clock
AES4 (In 7+8)
No Clock
AES5 (In 9+10)
No Clock
To manually select a fixed clock source, tap an available clock from the scrollbar and tap again on the required clock location. NOTE: When using Dante, ensure the SRC Clock is used to lock any other digital audio source to this processor.

All other processors on the network will be Dante Slaves, and the Primary Clock will report that the clock is overridden by Dante, as shown in the following screenshot. Any other 96 kHz signal, or 44.1 kHz based signal should be locked using the SRC Clock.


Primary Clock Source
Slave to Dante
96kHz - Locked
Auto Detection
Auto locks to 48/96/192 kHz
Manual Config
Manual locks to 48/96/192 kHz
OVERRIDDEN BY DANTE - Slave to Dante Network
Available I/O via Primary Clock: 48 / 96 / 192kHz
Sample Rate Converter Clock Source
Internal
96kHz - Locked
Auto 44 Detection
Auto 44 locks to 44.1/88.2/176.4 kHz
Auto 48 Detection
Auto 48 locks to 48/96/192 kHz
Manual 44 Config
Manual 44 locks to 44.1/88.2/176.4 kHz
Manual 48 Config
Manual 48 locks to 48/96/192 kHz
Available I/O via SRC Clock: 48 / 96 / 192kHz

CobraNet Clock

For Dolby Lake Processors containing a CobraNet® card with a valid CobraNet signal, the Clock Source Selector scroll bar will display primary clock and 96 kHz internal clock, as shown:


Primary Clock Source
CobraNet
48kHz - Locked
Auto Detection
Auto locks to 48/96/192 kHz
Manual Config
Manual locks to 48/96/192 kHz
CobraNet Status: Performer
Available I/O via Primary Clock: 48 / 96 / 192kHz
Sample Rate Converter Clock Source
Internal
88.2kHz - Locked
Auto 44 Detection
Auto 44 locks to 44.1/88.2/176.4 kHz
Auto 48 Detection
Auto 48 locks to 48/96/192 kHz
Manual 44 Config
Manual 44 locks to 44.1/88.2/176.4 kHz
Manual 48 Config
Manual 48 locks to 48/96/192 kHz
Available I/O via SRC Clock: 44.1 / 88.2 / 176.4kHz
Clock Source Selector
2 (In 3+4)
o Clock
AES3 (In 5+6)
No Clock
AES4 (In 7+8)
No Clock
SPDIF
No Clock
Internal
88.2kHz
CobraNet / Internal
48kHz / 96kHz
To manually select a fixed clock source, tap an availible clock from the scrollbar and tap again on the required clock location.

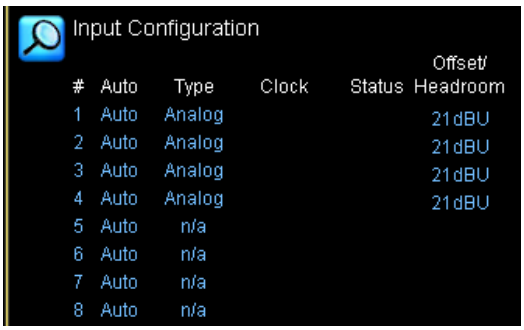
The CobraNet network decides which CobraNet device will control the clock setting. For further information on CobraNet, please refer to Section 7.2.7.

Note: CobraNet clock information is available only when a CobraNet card is installed.

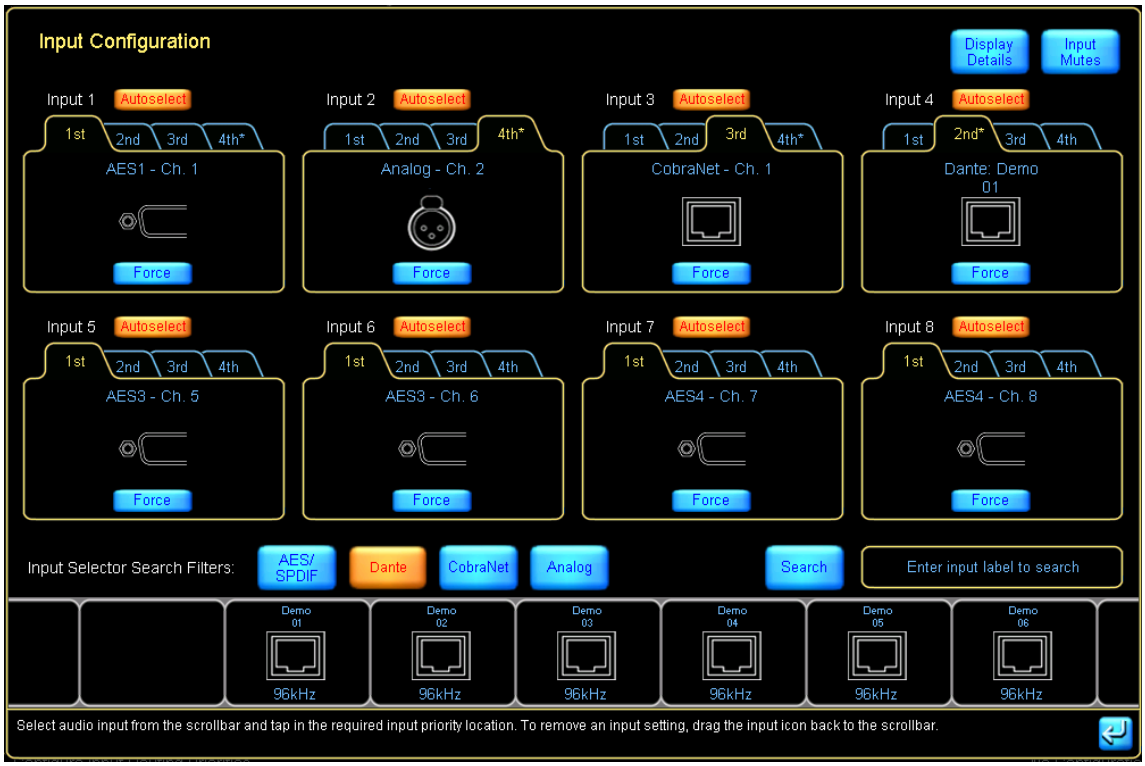
7.2.2 Input Configuration

Each input may be configured to use any available input source. Sources include AES/EBU digital inputs, S/PDIF digital inputs, CobraNet digital inputs (when a CobraNet card is installed), Dante inputs, and analog inputs.

To access the input configuration, tap the zoom button, or any area of the input configuration summary text on the **I/O Config** page, as shown here:



The **Input Configuration** window will be displayed:



Input Configuration Screen

Autoselect

The input Autoselect feature enables you to set up a redundant system. The Processor will attempt to use the first signal. If the first signal is unavailable, it will try the second, third, or fourth signal.

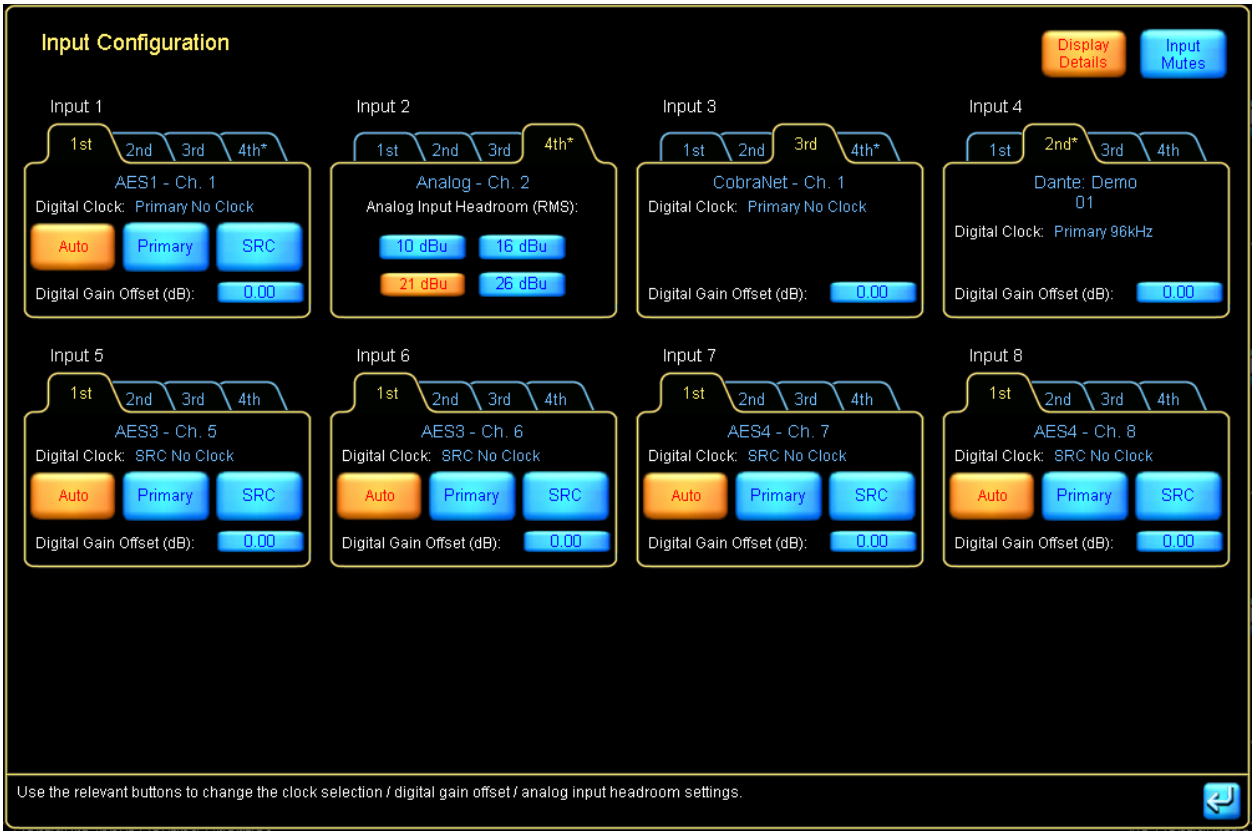
Force

The input Force feature forces the input to the selected input.

Input Selector Search Filters

- **AES/SPDIF**—Displays the available AES/SPDIF input signals
- **Dante**—Displays the available Dante input signals
- **CobraNet**—Displays the available CobraNet input signals
- **Analog**—Displays the available analog input signals
- **Search**—Filters the available input signals

Input Configuration Screen - Display Details


Input Configuration
Display Details
Input Mutes
Input 1
1st 2nd 3rd 4th*
AES1 - Ch. 1
Digital Clock: Primary No Clock
Auto Primary SRC
Digital Gain Offset (dB): 0.00
Input 2
1st 2nd 3rd 4th*
Analog - Ch. 2
Analog Input Headroom (RMS):
10 dBu 16 dBu
21 dBu 26 dBu
Input 3
1st 2nd 3rd 4th*
CobraNet - Ch. 1
Digital Clock: Primary No Clock
Digital Gain Offset (dB): 0.00
Input 4
1st 2nd* 3rd 4th
Dante: Demo 01
Digital Clock: Primary 96kHz
Digital Gain Offset (dB): 0.00
Input 5
1st 2nd 3rd 4th
AES3 - Ch. 5
Digital Clock: SRC No Clock
Auto Primary SRC
Digital Gain Offset (dB): 0.00
Input 6
1st 2nd 3rd 4th
AES3 - Ch. 6
Digital Clock: SRC No Clock
Auto Primary SRC
Digital Gain Offset (dB): 0.00
Input 7
1st 2nd 3rd 4th
AES4 - Ch. 7
Digital Clock: SRC No Clock
Auto Primary SRC
Digital Gain Offset (dB): 0.00
Input 8
1st 2nd 3rd 4th
AES4 - Ch. 8
Digital Clock: SRC No Clock
Auto Primary SRC
Digital Gain Offset (dB): 0.00
Use the relevant buttons to change the clock selection / digital gain offset / analog input headroom settings.

AES

- **Auto**—Chooses the clock most relevant to the incoming digital signal. For example, if the input signal is 48 kHz, the Primary Clock will be selected; if the input is 44.1 kHz, the SRC Clock will be selected. The default is Primary Clock if a digital input signal is not present.
- **Primary**—Uses the Primary Clock, regardless of whether the clock rate matches the incoming signal rate.
- **SRC**—Uses the SRC Clock, regardless of whether the clock rate matches the incoming signal rate.

Analog

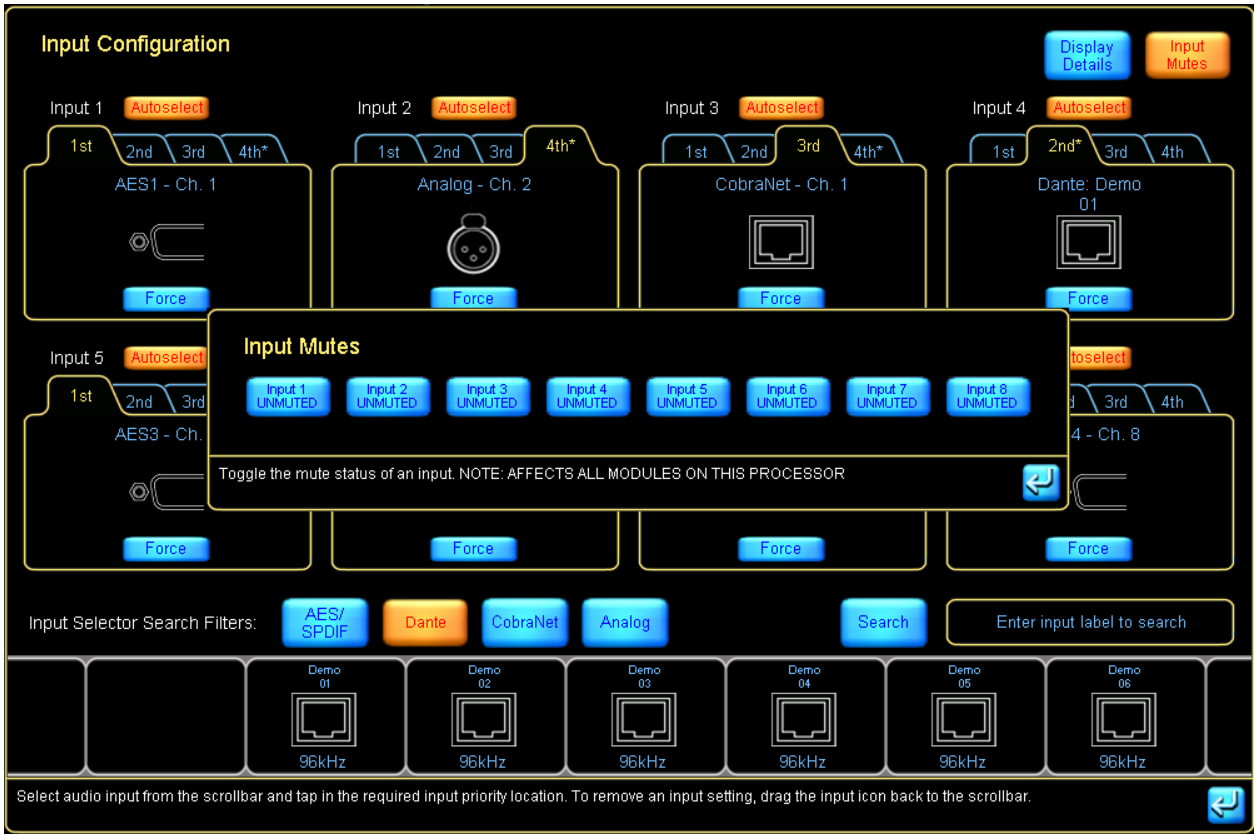
Analog Input Headroom (RMS)—Contains a four-way toggle for choosing 10, 16, 21, or 26 dBu. Tap the required headroom level to set the maximum RMS level for the input.

Note: The Contour Pro26 and Mesa Quad EQ provide adjustment for Input Headroom through a fader on the **Levels** page under **Headroom/AmpClip**.

Digital Gain Offset (dB)—Represents the amount of gain increase or reduction that will be applied to the digital input signal to allow seamless transition between all input types. As the levels of digital and analog signal vary, the digital offset can be used to adjust the digital input signal level to match the analog input signal level. This can be used in conjunction with Autoselect to provide an automatic analog backup to the incoming digital audio. Separate values are provided for AES and CobraNet; to change an offset, tap the value that you wish to change and enter a new value using the onscreen keyboard (or an external keyboard). These offsets are shown on the **I/O Config** page under each input pair summary.

Note: When aligning analog and digital signals using the Digital Gain Offset setting, the +4 dBu Reference meter mode should be used to ensure that levels are matched with respect to a common internal reference.

Input Mutes



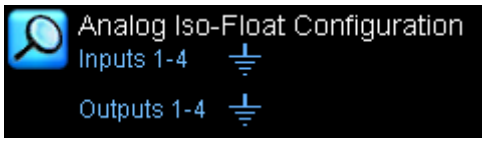
Muted input—Enables you to mute the audio from the input

Unmuted input—Enables you to unmute audio from the input

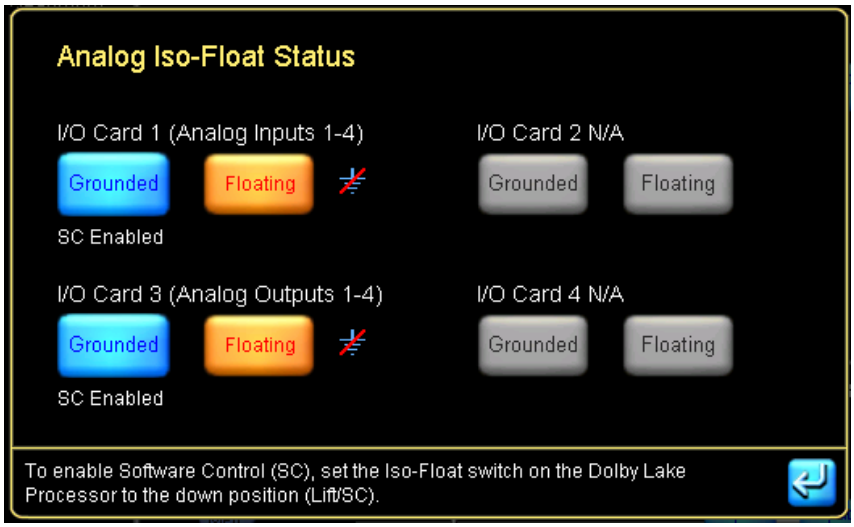
7.2.3 Iso-Float Status/Virtual Frame I/O Card Configuration

When an online frame is selected, this button will read **Analog Iso-Float Status**; when a Virtual Frame is selected, this button reads **Virtual Frame I/O Card Configuration.**

The Iso-Float™ Status reports the ground/lift settings for each analog I/O card. A summary of the current status is shown on the bottom left of the **I/O Config** page for online processors. The Iso-Float Status window is accessed by tapping the zoom button to the left of this summary as shown in the following screenshot:



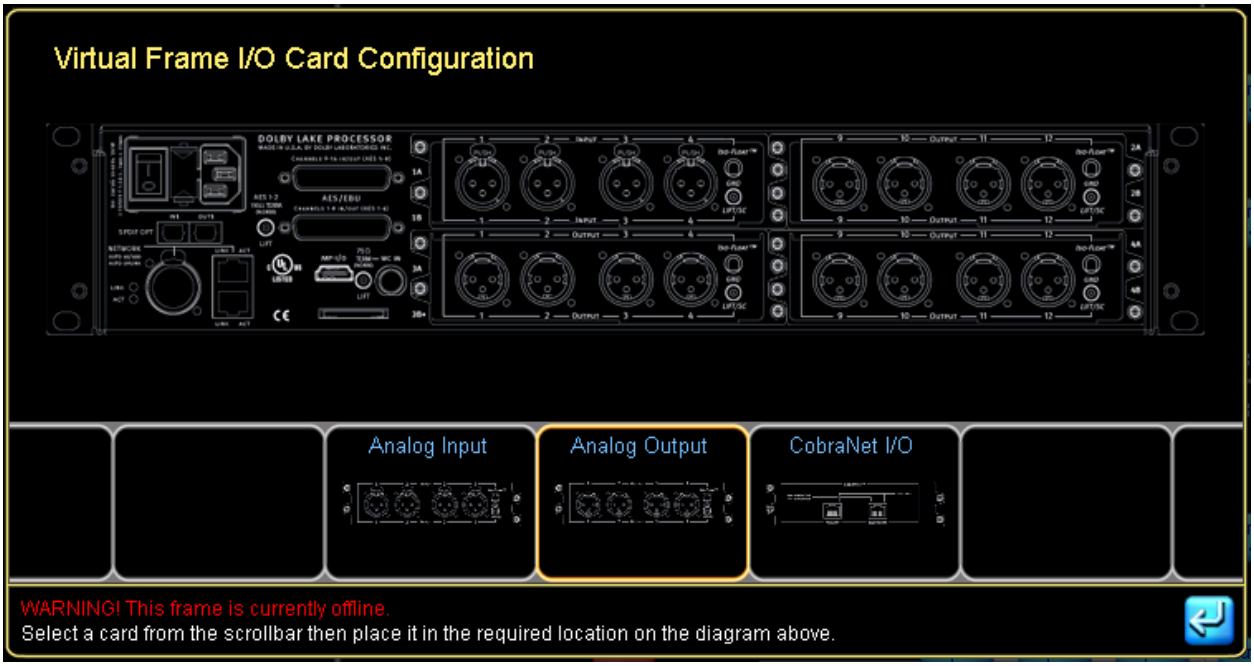
The current status is shown by an orange button, and whether software control is available is also identified per I/O card.



If the switch on the analog converter card is in the Lift/SC position, then this screen can be used to set the ground/lift status for that card. If the switch on the analog converter card is set to grounded (GND), then software control is disabled.

The following is displayed in the same location of the **I/O Config** page for Virtual Frames:

An interactive page is displayed showing a line drawing of the back panel of a Dolby Lake Processor. This allows drag-and-drop functionality to configure this offline processor in exactly the required hardware configuration and will provide the relevant I/O options based on this configuration.


Virtual Frame I/O Card Configuration
Analog Input
Analog Output
CobraNet I/O
WARNING! This frame is currently offline.
Select a card from the scrollbar then place it in the required location on the diagram above.

7.2.4 Input Mix Summary and Input Mixers/Switch

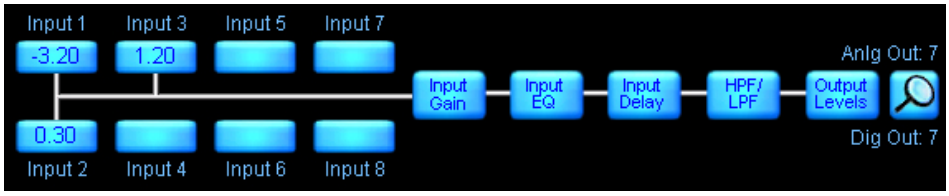
Input mix summaries and switches are shown on the **I/O Config** page as part of the interactive signal path for each module. The available number of inputs varies per product and module type as described in Table 7-1.

Table 7-1 Input Mix Summaries

Product	Input Mix Summary	Input Mixer with Faders
Lake Processor (Mesa EQ™ Module)	Eight-channel input gain mixer	Yes
Lake Processor (Contour Module)	Four-channel input gain mixer	Yes
Mesa Quad EQ	Four-channel input gain mixer	Yes
Contour Pro26	Two-channel switch (A/B/A+B)	No

Input Mix Summary

The block diagram for each module shows the connected inputs and associated gain settings. The following example shows a Dolby Lake Processor Mesa module.



Input Mixer

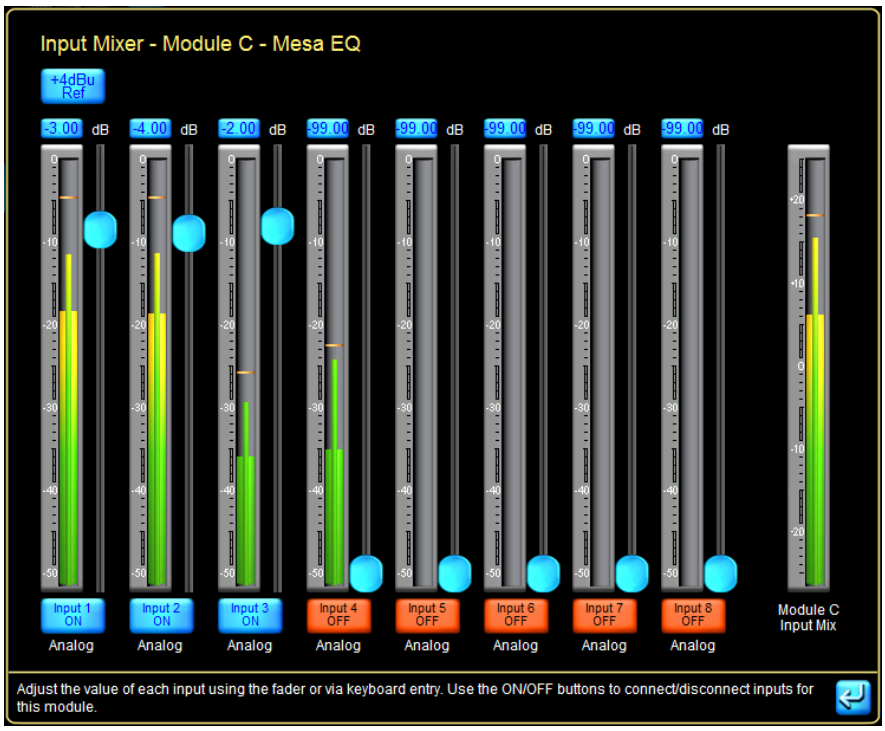
The Input Mixer provides the ability to mix up to eight incoming audio signals for Processor Mesa EQ modules, or four incoming audio signals for Processor Contour modules and for the Lake Mesa Quad EQ processor.

Note: The Input Mixer is not applicable for the Contour Pro26.

The Input Mixer can be accessed from two locations:

- By tapping the input mix summary from the **I/O Config** page
- By tapping the **Input Mixer** zoom button from the **Levels** page

The input mixer provides gain faders and on/off connection buttons as shown in the following screenshot:



To connect/disconnect an input, tap the button labeled **On/Off** or drag the fader. The total module input mix is shown on the far right of the Input Mixer window.

Input +4dBu Button

Tap the **Input +4dBu** button to view the physical input signal meter relative to +4 dBu. Tap the button again to return to the default Digital Clip (DClip) view.

The DClip metering mode shows the audio level prior to any gain adjustment (input headroom, or digital gain offset), and indicates when the A/D converters will clip. The +4 dBu metering mode shows the audio level after any gain adjustment, and is useful for comparing levels of different input signals prior to processing.

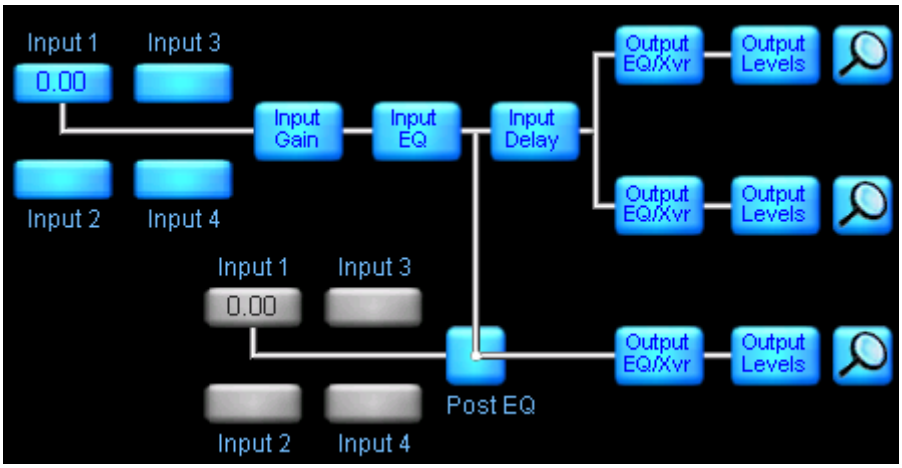
This is a global function; all physical input meters throughout the system display the reference selected here.

Note: Input Mixer settings are stored in system configuration files and in frame/system presets. The Input Mixer configurations are transferred during the Frame Replace function. Input Mixer configurations are not stored, recalled, copied, or pasted via module or base configuration files.

Auxiliary Input Toggle Switch

A spare auxiliary channel is available on the following module types:

- Classic 2-Way + 1 Auxiliary Output (CL2w+1a)
- Classic 3-Way + 1 Auxiliary Output (CL3w+1a)
- Linear Phase Classic 2-Way + 1 Auxiliary Output (LP2w+1a)

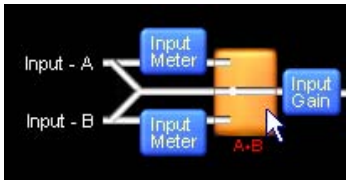


These module types provide a separate input selector for the auxiliary channel. This allows the auxiliary channel to be sourced independently of the two-way input source, or from the same post-input EQ signal. (The parametric [PEQ] and graphic [GEQ] overlays for the two-way section also affect the auxiliary channel when the input switch is set as shown in the previous figure.)

Contour Pro26 Input Switch

For Contour Pro26 products, either input A or B, or a combination of both, can be selected as the source signal; there is no gain control for this product type.

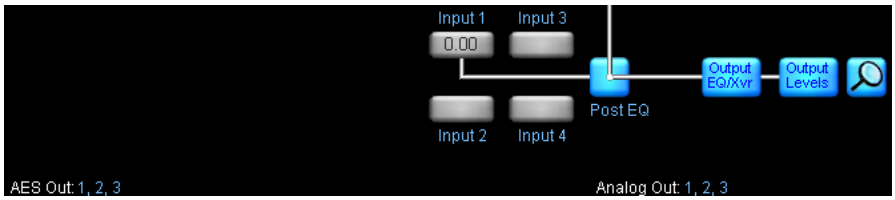
To change the input used as the source signal, tap the input switch:



The input selector toggles between Input A, Input A+B, and Input B.

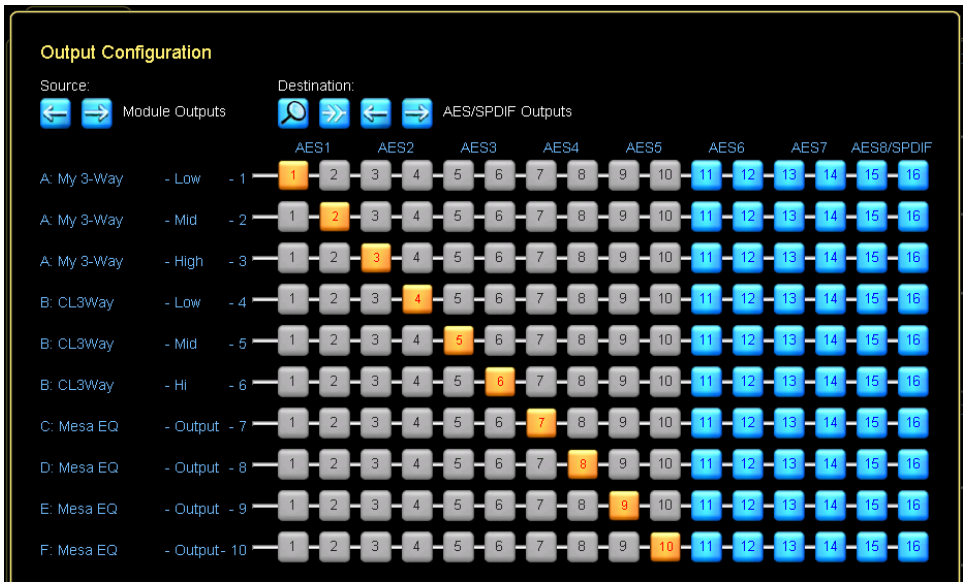
7.2.5 Output Configuration

The **Output Configuration** window is displayed after tapping the zoom button located to the right of each output on the right side of the **I/O Config** page. A summary of the output connections for each module appears at the bottom of each module cell on the **I/O Config** page.



After tapping any of these zoom buttons, the following **Output Configuration** window is displayed.

Output Configuration Screen


Output Configuration
Source:
Module Outputs
Destination:
AES/SPDIF Outputs
AES1 AES2 AES3 AES4 AES5 AES6 AES7 AES8/SPDIF
A: My 3-Way - Low - 1
A: My 3-Way - Mid - 2
A: My 3-Way - High - 3
B: CL3Way - Low - 4
B: CL3Way - Mid - 5
B: CL3Way - Hi - 6
C: Mesa EQ - Output - 7
D: Mesa EQ - Output - 8
E: Mesa EQ - Output - 9
F: Mesa EQ - Output - 10

The text on the left side of the screen lists the output channels for each module. The orange numbered blocks denote the digital outputs from which the signal will be sent. The same audio channel can be sent from multiple digital outputs, but each digital output can contain only one channel of audio.

The following sections discuss the icons under the Source and Destination areas.

Source

The two arrow buttons enable you to select which source to route to the Dolby Lake Processor outputs. The default setting is Module Outputs, which are the Dolby Lake Processor DSP outputs. It can also be set to AES Inputs and Analog Inputs (Dante Inputs or CobraNet Inputs, if available), which bypass the DSP.

Destination

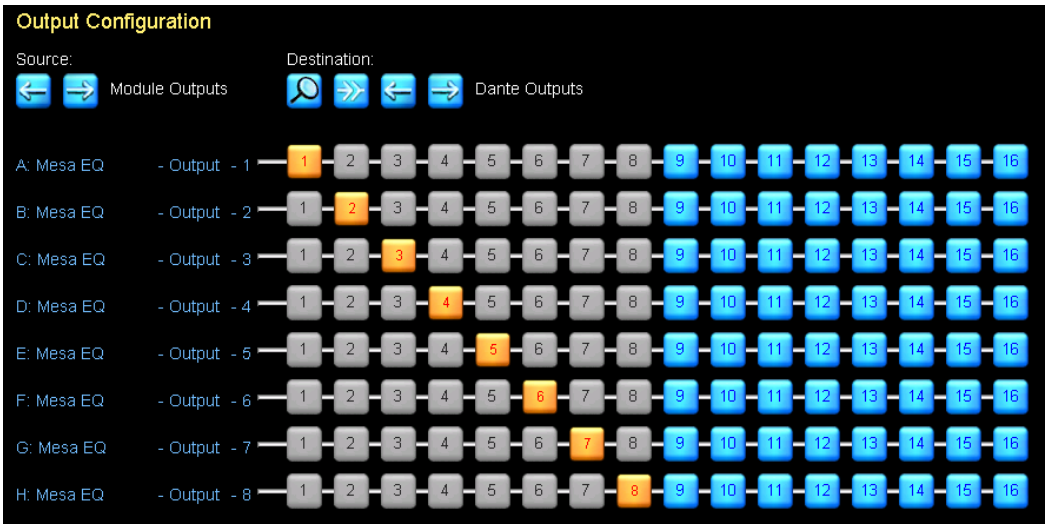
The two arrow buttons enable you to select the outputs to route the source to. The default setting is AES/SPDIF. It can also be set to Analog (if analog output cards are present), Dante, and CobraNet, if available.

The following screenshots show some routing options.

Module Outputs

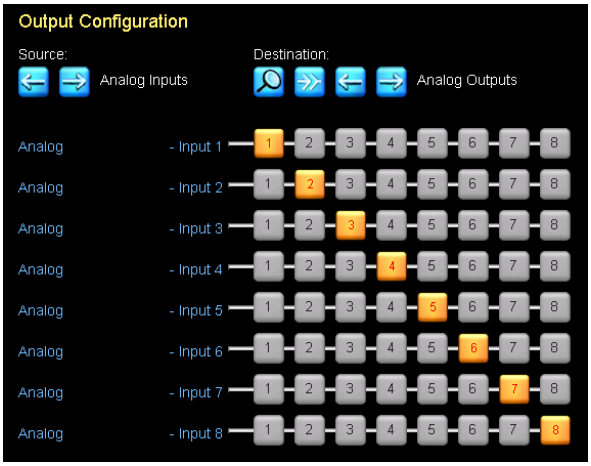
The eight DSP outputs (Module Outputs) are routed to the first eight AES outputs.

The same DSP outputs are also routed to the first eight Dante outputs.


Output Configuration
Source:
Module Outputs
Destination:
Dante Outputs
A: Mesa EQ - Output - 1
B: Mesa EQ - Output - 2
C: Mesa EQ - Output - 3
D: Mesa EQ - Output - 4
E: Mesa EQ - Output - 5
F: Mesa EQ - Output - 6
G: Mesa EQ - Output - 7
H: Mesa EQ - Output - 8

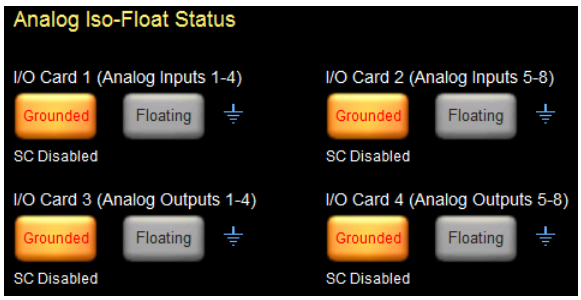
Analog Inputs

The eight analog inputs are directly routed to the first eight analog outputs.



The magnifying glass provides different options, depending on the selected destination.

If **Analog Outputs** is selected, tapping the magnifying glass icon displays the **Analog Iso-Float Status** screen:



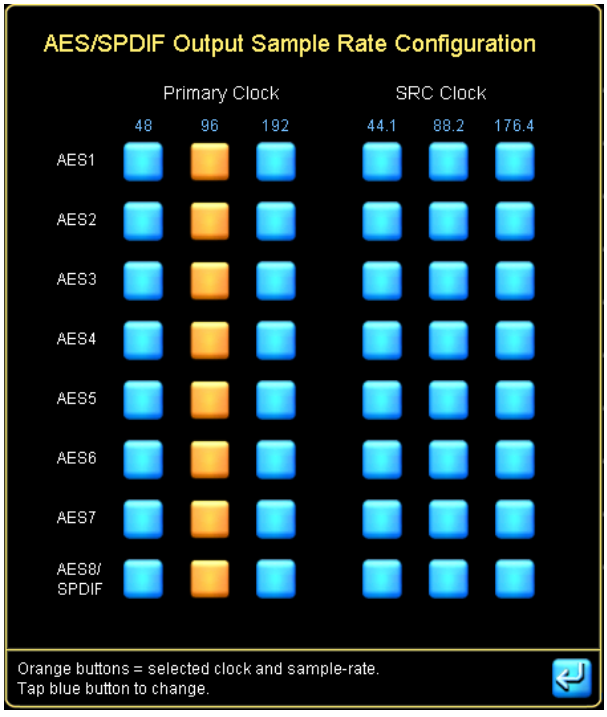
Grounded I/O card will be connected to ground.

Floating I/O card will not be connected to ground.

I/O Card Card in the Dolby Lake Processor to provide either inputs or outputs.

SC Disabled (Software Control Disabled) If the I/O card on the Dolby Lake Processor has its Iso-Float switch set to Lift/SC, the user can control the Grounded or Floating using the Dolby Lake Controller. If this switch is set to Grounded, software control is disabled.

If **AES/SPDIF Outputs** is selected, tapping the magnifying glass icon displays the **AES/SPDIF Output Sample Rate Configuration** screen:



Primary Clock—Locks to a sample rate of 48, 96, or 192 kHz (no sample-rate conversion, very low latency)

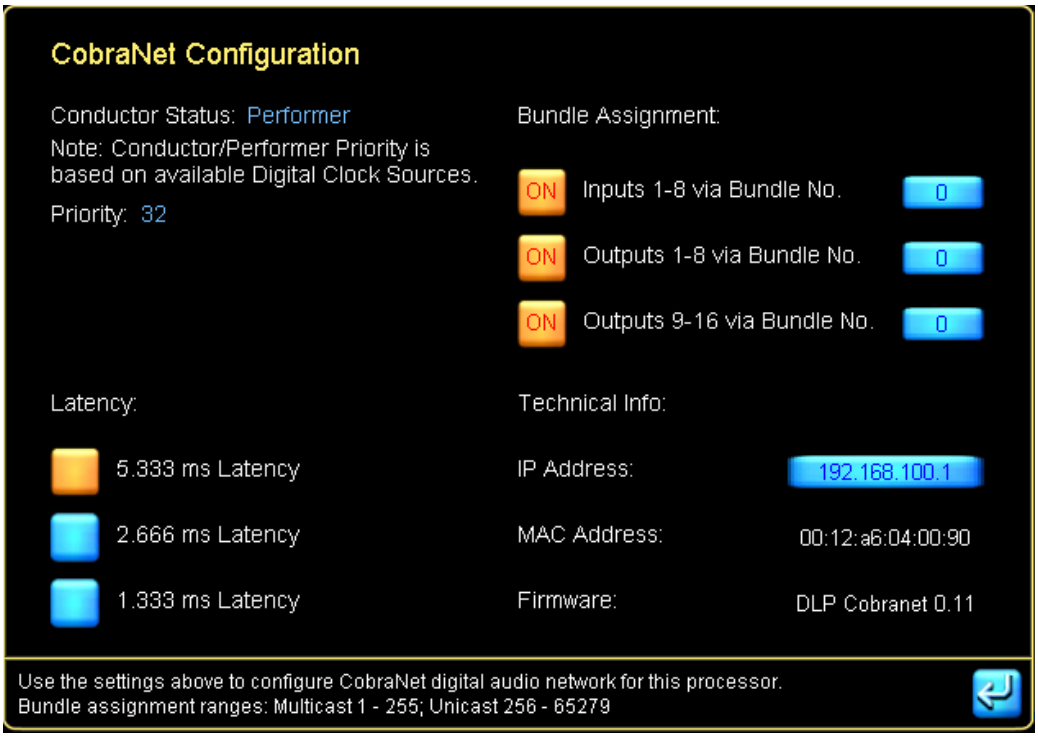
SRC Clock—Locks to a sample rate of 44.1, 88.2, or 176.4 kHz

Note: The signal from AES8 (Dig Out 15/16) is also duplicated on the S/PDIF output.

When Dante is available, tapping the magnifying glass icon displays the **Dante Configuration** screen. See Section 3.3.7 for details about **Dante**.

Dante Configuration
Dante Enabled
Transmit Outputs
Master for Dante Network
Receive Enabled / Transmit Enabled
Minimum Latency
0.8 ms
1.3 ms
4.0 ms
Output Channel Labels
Auto Multi Uni Out1: 01
Auto Multi Uni Out2: 02
Auto Multi Uni Out3: 03
Auto Multi Uni Out4: 04
Auto Multi Uni Out5: 05
Auto Multi Uni Out6: 06
Auto Multi Uni Out7: 07
Auto Multi Uni Out8: 08
Auto Multi Uni Out9: 09
Auto Multi Uni Out10: 10
Auto Multi Uni Out11: 11
Auto Multi Uni Out12: 12
Auto Multi Uni Out13: 13
Auto Multi Uni Out14: 14
Auto Multi Uni Out15: 15
Auto Multi Uni Out16: 16
NOTE: When Dante is enabled, ensure the SRC Clock is used to lock any additional digital signal to this processor.

When CobraNet is available, tapping the magnifying glass icon displays the **CobraNet Configuration** screen. See Section 7.2.7 for more details.


CobraNet Configuration
Conductor Status: Performer
Note: Conductor/Performer Priority is based on available Digital Clock Sources.
Priority: 32
Bundle Assignment:
ON Inputs 1-8 via Bundle No. 0
ON Outputs 1-8 via Bundle No. 0
ON Outputs 9-16 via Bundle No. 0
Latency:
5.333 ms Latency
2.666 ms Latency
1.333 ms Latency
Technical Info:
IP Address: 192.168.100.1
MAC Address: 00:12:a6:04:00:90
Firmware: DLP Cobranet 0.11
Use the settings above to configure CobraNet digital audio network for this processor.
Bundle assignment ranges: Multicast 1 - 255; Unicast 256 - 65279

Tapping this icon, , displays a warning message. The message asks whether you want to disconnect all selected outputs assignments on the Processor.

7.2.6 Latency Match

This button is available on Dolby Lake Processors only; it is blue when disabled and orange when enabled.

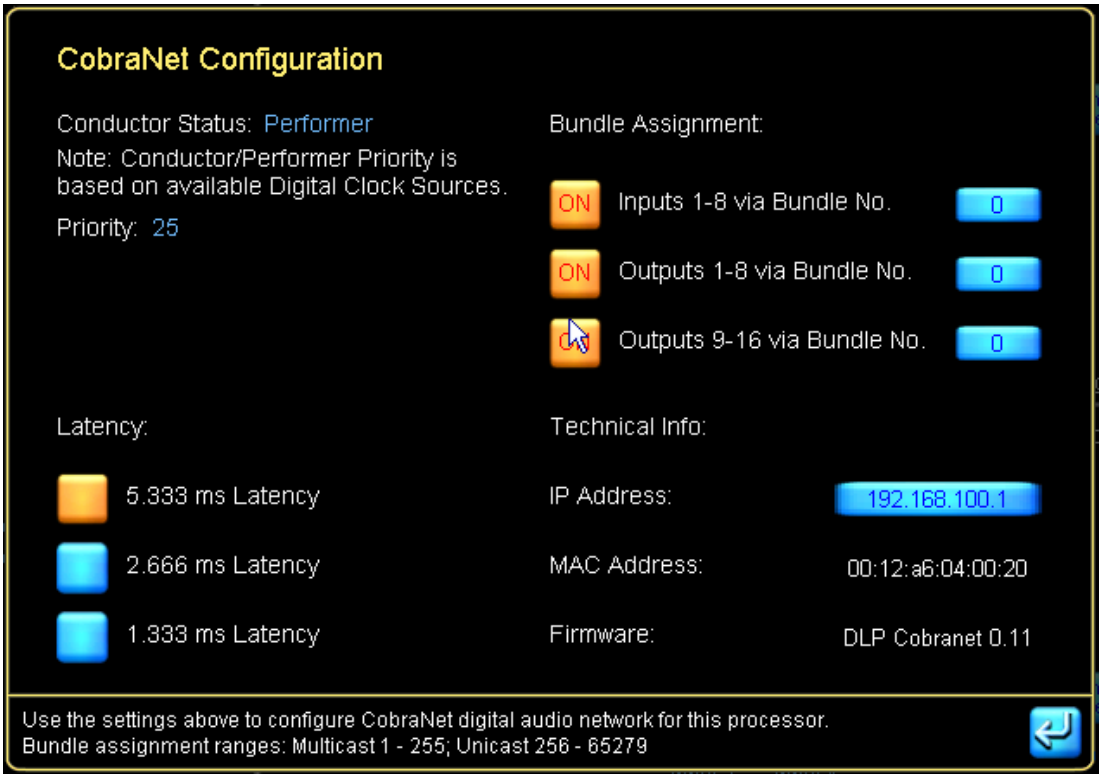
The **Latency Match** feature adds an additional latency to the Dolby Lake Processor signal so it can be seamlessly integrated with legacy Contour Pro26 or Mesa Quad EQ products. This **Latency Match** feature functionality is based on the following criteria:

- The input types for legacy products and the Dolby Lake Processor are the same (analog or AES only).
- The input sample rates for legacy products and the Dolby Lake Processor are the same where AES inputs are being used.
- The outputs are analog.

For any other scenarios, please make any appropriate delay adjustments manually.

7.2.7 CobraNet

The button is visible only for a Dolby Lake Processor that contains a CobraNet card. The following screen is displayed when this button is tapped:



Conductor Status—Displays either Conductor or Performer. (A Conductor provides the digital clock to the CobraNet network, Performers lock to the Conductor's digital clock.)

Priority—An automatically assigned value based on the clock selection as defined in Table 7-2. The CobraNet network uses this value to determine which processor will become the Conductor.

Latency—A user-defined setting for CobraNet specific latency. (Ensure all CobraNet devices on the network are configured with the same latency selection.)

Bundle Assignment—A user-defined bundle numbering. CobraNet bundles contain eight audio channels (20-bit/48 kHz) which are numbered to enable another device to use these channels from the CobraNet network. Bundle assignment ranges are: 0 = not assigned; 1–255 = Multicast Bundle; 256–65279 = Unicast Bundle.

Addresses—A user-definable IP address is provided for the CobraNet card (this is distinct to the Dolby Lake Processor). The media access control (MAC) address of the CobraNet card is provided for information only, along with the card's firmware version.

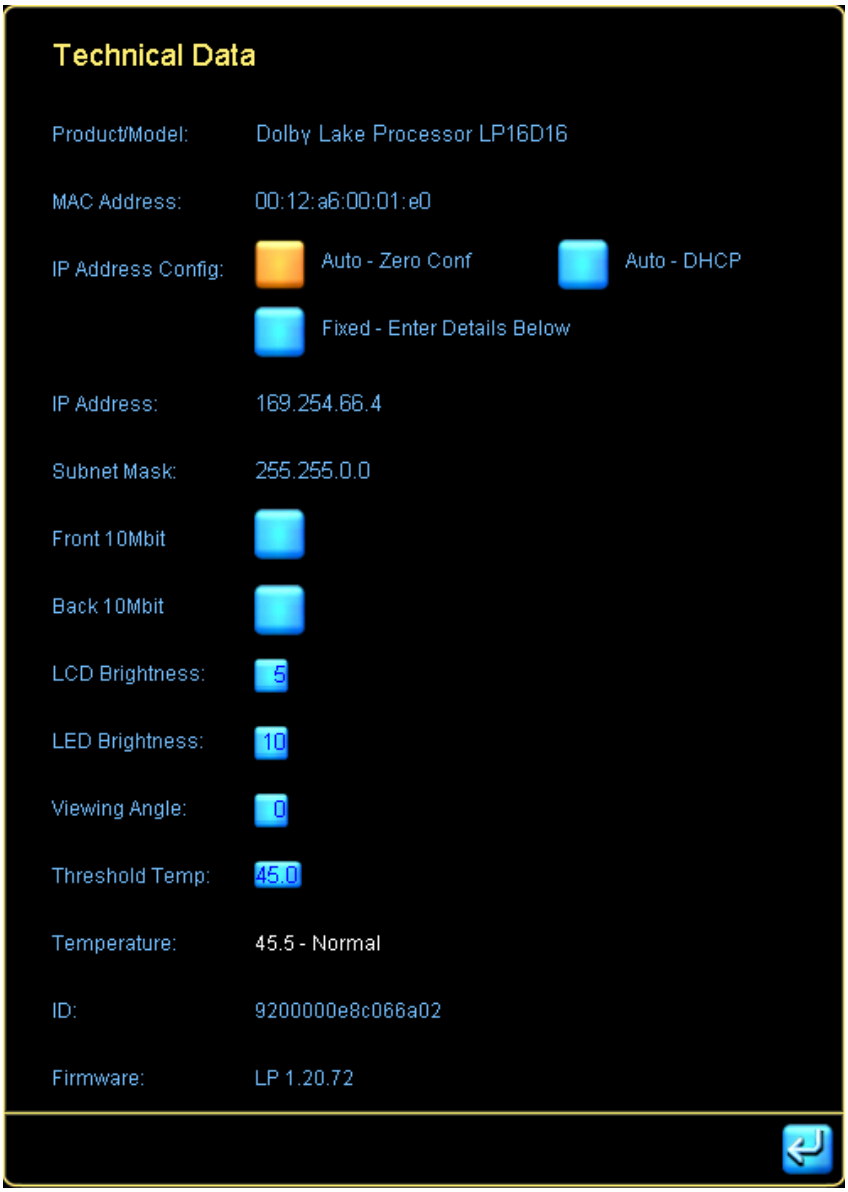
Table 7-2 CobraNet Conductor Priority Values

Clock Type	Present and Locked	Auto-Primary-Clock-Configuration (First Clock Found in Auto-Clock-Priority List) CobraNet Conductor Priority Value	Manual-Primary-Clock-Configuration (Clock Specifically Selected) CobraNet Conductor Priority Value
BNC Word Clock	Yes	92	128
	No	N/A—select next clock	31
AES1	Yes	82	127
	No	N/A—select next clock	30
AES2	Yes	72	126
	No	N/A—select next clock	29
AES3	Yes	62	125
	No	N/A—select next clock	28
AES4	Yes	52	124
	No	N/A—select next clock	27
SPDIF	Yes	42	123
	No	N/A—select next clock	26
Internal/CobraNet (always present)	Yes	25	122

Note: CobraNet functions are available only when a CobraNet card is installed.

7.2.8 Technical Data

This information is available by tapping the button labeled **Technical Data** from the **I/O Config** page button bar (or pressing <F5>) when a Dolby Lake Processor is selected. It is permanently displayed on the left side of the **I/O Config** page for Contour Pro26 and Mesa Quad EQ processors.



Product/Model—The description and model number for the selected processor.

MAC Address—The MAC address is the unique Ethernet address of the selected processor.

IP Address Config—This field is set by default to Auto - Zero Conf. It can also be set to Auto - DHCP (if a DHCP server is used) or to Fixed.

IP Address—The Internet protocol (IP) address identifies which processor is sending or receiving information.

Subnet Mask—The subnet mask is used for IP address routing; the default setting is 255.255.0.0 when Auto - Zero Conf is selected.

Front 10Mbit—This setting forces the front Ethernet port to 10 Mbps.

Back 10Mbit—This setting forces the back EtherCon® Ethernet port to 10 Mbps.

LCD Brightness—The value between 0 (dim) and 10 (bright) adjusts the brightness of LCDs on the front panel.

LED Brightness—The value between 0 (dim) and 10 (bright) adjusts the brightness of LEDs on the front panel.

Viewing Angle—The value between –10 (view from below) and +10 (view from above). It adjusts the front-panel LCD viewing angle.

Threshold Temp—The temperature at which fan speed increases (°C).

Temperature—The current temperature inside the processor (°C).

ID—The unique Dolby Lake product identifier.

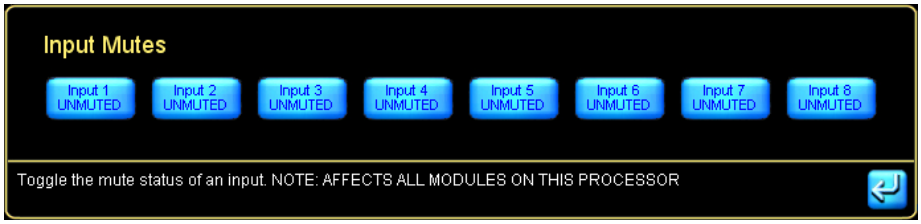
Firmware—The firmware version.

7.2.9 Input Mutes

Input Mutes represent the actual inputs to the Dolby Lake Processor. Muting an input via Input Mutes will mute the signal to all modules that are connected to that input.

The floating **Input Mutes** toolbar shown below is available by:

- Tapping **Input Mutes** from the button bar on the **I/O Config** page (or pressing <F6>)
- Tapping the **Input Mutes** zoom button from the **Levels** page


Input Mutes
Input 1 UNMUTED
Input 2 UNMUTED
Input 3 UNMUTED
Input 4 UNMUTED
Input 5 UNMUTED
Input 6 UNMUTED
Input 7 UNMUTED
Input 8 UNMUTED
Toggle the mute status of an input. NOTE: AFFECTS ALL MODULES ON THIS PROCESSOR

Note: Input Mutes are not available when a Processor is offline. Input Mutes are not available for Contour Pro26.

7.2.10 Interactive Signal Path Block Diagram

The signal path of each module is shown in graphical form on the right of the **I/O Config** page. Each of the blocks can be selected to navigate directly to the associated EQ/Levels/Xover/Aux/HPF/LPF screens.

Note: After using the interactive block diagrams to access the EQ/Levels/Xover/Aux/HPF/LPF screens, the **EQ/Levels Exit** button returns you to the **I/O Config** page instead of **Home**.

7.2.11 Input Selection (Contour Pro26 and Mesa Quad EQ Only)

Some Contour Pro26 units are fitted with a special five-pin stereo I/O digital XLR connector. This provides digital input only when configured as any type of crossover/loudspeaker processor. The Stereo Insert program provides simultaneous digital stereo input and output.

The Mesa EQ processor has two pairs of AES/EBU stereo inputs that can be independently set to accept analog or digital input. The input options described in the following sections are available on submenus **Input 1/2 Select** and **Input 3/4 Select**.

Autoselect AES/Anlg

Contour Pro26 and Mesa EQ processors fitted with digital inputs offer the option of analog only or digital and analog inputs. By default, the processors automatically select which input is being used.

When active (orange), the Autoselect AES/Anlg function detects and locks a digital input signal, or uses the analog input signal if a digital signal cannot be detected.

Table 7-3 summarizes the available input selections and the associated output signals available.

Table 7-3 Input Selections

Controller Input Selection Status	Signals	Signal Used	Analog Output	Digital Output
Autoselect AES/Anlg	AES Only	AES	Yes	Yes
	Analog Only	Analog	Yes	No
	AES + Analog*	AES*	Yes*	Yes*
Forced AES	AES Only	AES	Yes	Yes
	Analog Only	None	No	No
Forced Analog	AES Only	None	No	No
	Analog Only	Analog	Yes	Yes

** If the digital signal is lost while in Autoselect AES/Analog mode, the processor will switch to use analog input. Analog output will continue (using the analog input source), although digital output will cease. This is applicable to Contour Pro26 and Mesa Quad EQ processors only.*

Forced Analog/Forced Digital

These settings lock the input signals to the associated analog or digital inputs, effectively disabling the other input.

These buttons are active only if both digital and analog inputs are available on the selected processor.

Dig Out 96kHz/Dig Out 48kHz

The buttons toggle between output sample rates of 48 and 96 kHz.

These buttons will be active only if both digital and analog inputs are available on the selected processor, and the **Forced Analog** button is selected.

7.2.12 Frame Config/Factory Reset

For Dolby Lake Processors, the **Frame Config** menu offers configuration as:

- Contour—Four Contour Modules (ABCD)
- Contour/Mesa EQ Combination—Two Contour modules (AB) and four Mesa EQ modules (CDEF)
- Mesa EQ—Eight Mesa EQ modules (ABCDEFGH)

For the Contour Pro26 or Mesa Quad EQ, the Factory Reset option configures the processor in its relevant factory default state.

Note: For all products, configuring or resetting a processor through the Dolby Lake Controller retains the current IP address setting and system/frame presets.

7.3 Label & Lock

From the **Modules** menu, tap **Label & Lock** to view a submenu with functions to label a module or frame and allow a system designer to lock module and base configurations.

7.3.1 Module Label

The Module Label is a user-definable value at the bottom of the module icon that identifies the module.

To label a module:

1. Tap the desired module icon on the **Main** page.
2. Tap **Module Label**, enter a module name, and tap **OK**.

7.3.2 Frame Label

The Frame Label is a ten-character (Dolby Lake Processor) or four-character (Contour Pro26 and Mesa Quad EQ) user-defined value that appears on the module icon and on the front panel of the processor. The Frame Label allows the module icons to be associated with a specific Dolby Lake Processor.

To label a frame:

1. Tap any module of the frame you wish to label.
2. Tap **Frame Label**.
3. Enter a frame name, and tap **OK**.

Note: When a frame consists of two modules (two- and three-way modules), naming one of them automatically updates the other module icon with the new label.

7.3.3 Module and Base Configuration Locking

The following functions are active only in Designer Mode:

- Module Unlocked/Unlock Module
- Set Mod Password
- Base Unlocked/Unlock Base
- Set Base Password

For details on these functions, please refer to Chapter 18.

7.4 Copy/Paste/Replace

From the **Modules** menu, tap the **Copy/Paste/Replace** button to view a submenu that allows the transferring of data between modules. This enables fast and easy setup of multiple speakers of the same type and configuration. The Replace function allows you to assign a different physical processor to perform the task of a selected processor (that is, to swap data from one processor to another). The Batch Replace function allows you to quickly transfer data from a virtual or offline configuration to another set of online frames.

7.4.1 Copy

This function is active only when a module icon is selected.

To copy data from a module:

1. Tap the module icon that contains the data to copy.
2. Tap **Copy**.

7.4.2 Paste

This function is active only when module data has been previously copied and a destination module icon is selected.

To paste data to a module:

1. Tap the module icon in which to paste the data.
2. Tap **Paste**.

Note: You cannot paste data to a module that currently has a different module type if the destination module is currently assigned to a group. To change the destination module's module type by continuing with the Paste function, you must first deassign the module from the group (refer to Chapter 9). A Mesa EQ module cannot be pasted into a Contour module and vice versa.

7.4.3 Replace Frame

The Replace function allows transfer of module/group data between processors. If a previously used processor is not available, or you wish to change which unit performs which task, follow these steps:

1. Tap **Copy/Paste/Replace** from the **Modules** menu.
2. Tap a module from the frame you wish to replace on the work area.
3. Tap **Replace Frame**. The module scroll bar appears displaying used and available modules.

4. Tap any module from an available frame on the scroll bar, and tap **Complete Replace**. To locate a particular processor, tap the **Sel** button on the front panel to center that unit on the scroll bar.

Note: A frame can only be replaced with a frame of the same product type that is not currently in the work area (that is, it must be available on the module scroll bar).

All modules of a frame must be present on the module scroll bar for the Replace Frame function to work.

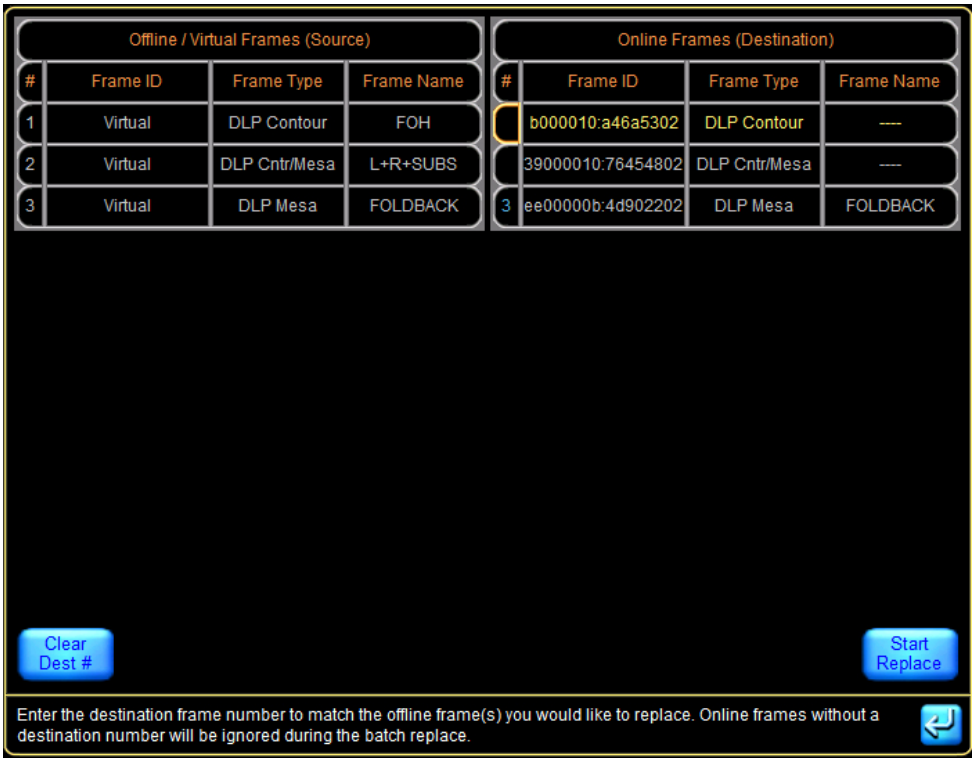
For the Dolby Lake Processor, the source and destination frames must be in the same configuration (for Contour, Mesa, or Contour/Mesa hybrids).

7.4.4 Complete Replace

This button completes the Replace Frame function. This function is active only when the **Replace** button is selected and a destination module has been selected from the module scroll bar. Unless a virtual frame is selected, all modules in the work area are returned to the scroll bar and those previously on the scroll bar are loaded with the data from the source frame and become part of the system configuration.

7.4.5 Batch Replace

This button is active (blue) regardless of whether a module is selected in the work area. When tapped a screen similar to this will be displayed:


Offline / Virtual Frames (Source)
Frame ID Frame Type Frame Name
1 Virtual DLP Contour FOH
2 Virtual DLP Cntr/Mesa L+R+SUBS
3 Virtual DLP Mesa FOLDBACK
Online Frames (Destination)
Frame ID Frame Type Frame Name
b000010:a46a5302 DLP Contour ----
39000010:76454802 DLP Cntr/Mesa ----
3 ee00000b:4d902202 DLP Mesa FOLDBACK
Clear Dest #
Start Replace
Enter the destination frame number to match the offline frame(s) you would like to replace. Online frames without a destination number will be ignored during the batch replace.

The left half of the screen displays all offline or virtual frames that are present in the system, and the right half displays all online frames. Note that to complete this replace operation, all online destination frames must be on the module scrollbar, and not in use in the current configuration.

Frames are sorted by Frame Type (product/configuration), then by frame name. If the product type and frame name match between an online and offline frame, a number will automatically be assigned to the destination frame.

Pressing the ME/SEL button on the front panel will identify the selected destination frame with yellow highlighting. (The first frame in the list is selected in the preceding example.)

Assigning the Virtual Frames to the Destination Frames

With the exception of very small systems, the virtual/offline frame must be labeled to enable identification of which frame it is. If the destination frame is also labeled with a matching name, and is of the same product type and configuration, the assignment will be automatic. Tapping **Start Replace** will copy all data on all frames.

If the destination frames are not labeled:

1. Type the corresponding offline/virtual frame number into the editable field, either via the onscreen or a manual keyboard.

2. The destination frame will move up or down the list so that it is on the same row as its corresponding offline/virtual frame.

3. Tap **Start Replace**, then tap **YES** to the confirmation message.

All offline/virtual frame data will be transferred to the online frames.

7.5 Remove

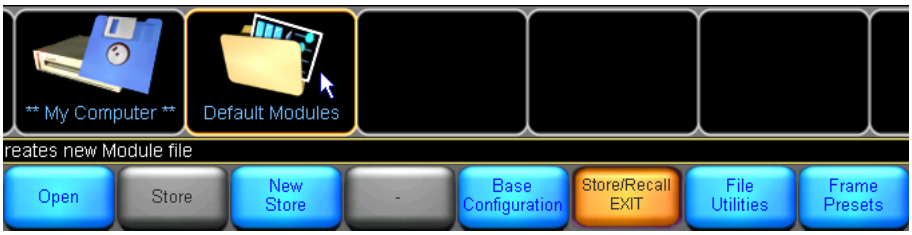
Tap **Remove** to delete the selected module from the current system configuration. The module icon will appear back on the scroll bar indicating it is available for use. To remove a module from the current system, tap the module icon from the **Modules** menu and tap **Remove**. Audio will not be affected unless the module is assigned to a group that contains settings that affect the audio of the module.

You can also remove a module by dragging the icon to the module scroll bar when in the **Modules** menu.

Note: No warning message is displayed unless the selected module is assigned to a group. In this instance, removing the module from the work area deassigns the module from all groups it is currently assigned.

7.6 Module Store/Recall

Tap the **Module Store/Recall** button to view a submenu containing functions that load and save module and base configurations, and to store frame presets. The button bar displays the following options and a scroll bar with files and folders.



For detailed information on all of the module file types supported by the Dolby Lake Controller, please refer to Section 3.7.

7.6.1 Recall/Open

This button's function and label depends on whether a folder or file is selected. It is inactive when neither a file nor folder is selected, or when a group icon is selected in the work area.

The button is labeled **Open** when a folder is selected. To open a folder, tap the desired folder icon on the scroll bar, then tap **Open**.

Note: Double-tapping a folder or file icon also opens the folder or file.

The button is labeled **Recall** when a file is selected. To recall a module file, tap the desired file, then tap **Recall**. Confirm the action by tapping the **Yes** button in the warning message.

Note: Recalling a module file overwrites all data currently stored in the selected module and removes the module from any groups.

7.6.2 Store

The **Store** button stores over an existing file. This button is active only when a file is selected.

1. Tap an existing file to store over (overwrite).
2. Tap **Store**.
3. Confirm the action by tapping the **Yes** button in the warning message.

Note: If the selected file is set to Read Only, this function is gray (inactive).

7.6.3 New Store

The **New Store** button stores the current module configuration under a new file name.

1. Navigate the file system, and tap the desired destination folder to select it.
2. Tap **New Store.**
3. Enter the file name.
4. Tap **OK**. The scroll bar displays the new file.

7.6.4 Base Configuration

A base configuration file defines a starting point for the module setup. It contains EQ and levels settings, invisible to the user, which represent the appropriate general configuration for a particular speaker type.

EQ and levels settings for an existing module (and crossover settings for Contour) may be saved as a base configuration for future use when configuring new modules. A system designer can also lock access to the **Xover** screen (Contour) or **HPF/LPF** screen (Mesa EQ) within the base configuration file. For details on this function, please refer to Chapter 18.

The Recall/Open, Store, and New Store functions operate identically as described above, but the available files/folders in the scroll bar change when **Base Configuration** is selected.

To store or recall a base configuration file, perform the following steps:

1. Select a module icon in the work area.
2. Tap **Module Store/Recall** from the **Modules** menu.
3. Tap **Base Configuration**.
4. Navigate to the desired folder/file.
5. Use the **Recall/Store/New Store** functions as required.

Note: A base configuration file cannot be stored from a virtual frame.

7.6.5 File Utilities

This button provides a submenu containing further functions that manage files and folders from within the Dolby Lake Controller.

Open

This button is active only when a folder is selected. Tap **Open** to open the selected folder.

Read Only

This function protects important files from being accidentally overwritten or deleted and is active only when a file is selected. The currently selected file's status is identified by the color of the **Read Only** button:

Orange—The selected file is set to Read Only.

Blue—The selected file is not set to Read Only.

To change the Read Only status of a file:

1. Tap a file from the scroll bar to select it.
2. Tap **Read Only** to toggle function on (orange) and off (blue).

Rename

This button allows the name of a file/folder to be changed.

1. Tap the required file/folder from the scroll bar, then tap **Rename**.
2. Enter the new name, and tap **OK**.

Delete

This button is active only when a file or folder is selected. When a file is selected, this function will only be available if the file is not set to Read Only. To delete a file or folder:

1. Tap a file or folder to select it, then tap **Delete**.
2. Confirm action by tapping **Yes** in the warning message.

Note: Deletion of a file is permanent and cannot be restored using the Undo function.

New Folder

This button creates a new folder in the current directory.

1. Navigate to the desired directory to locate the new folder.
2. Tap **New Folder**.
3. Enter the folder name, and tap **OK**.

7.6.6 Frame Presets

A maximum of 30 frame configurations can be stored in the processor (a maximum of 6 are available for the Mesa EQ and Contour Processors). These settings can be activated instantly using the front panel, without the use of the Dolby Lake Controller software.

The **Frame Presets** button provides a submenu containing the following functions:

Store

This button is active only when a module of an online frame is selected and a preset location is selected that is not empty (such as when overwriting an existing preset).

To overwrite the settings of the frame preset:

1. Load or configure both modules of the frame with the required settings.
2. Tap a module icon of the frame containing the data you wish to store.
3. Tap **Frame Presets** from the **Module Store/Recall** menu.
4. Select a previously used preset location, and tap **Store**.

Store with New Name

This button is active only when a module of an online frame is selected and a preset location is selected. The function is similar to Store, but always provides the onscreen keyboard for entering a preset name.

Clear

This button is active only when a module of an online frame is selected and a preset location containing data is selected.

To delete the data in a preset location, perform the following steps:

1. Tap a module icon of the frame containing the preset for deletion.
2. Select the preset location from the scroll bar.
3. Tap **Clear**, then **Yes** to the warning message.

7.7 Add Page

The Add Page function is always available from the **Modules** menu and creates additional pages that help manage large systems with many module and group icons.

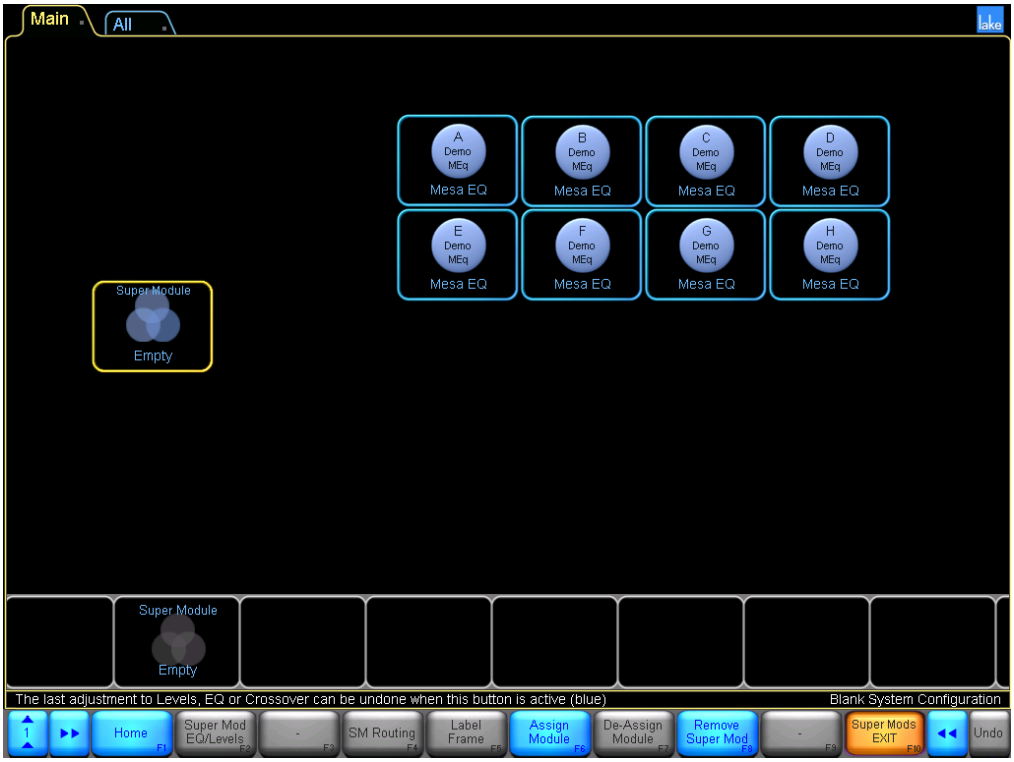
7.8 Super Modules

Super modules enable the user to control modules that span multiple frames as a single entity in the user interface. A super module can be a combination of two or more processing modules on the same or different frames that act together to provide the same audio processing with flexible output routing.

Note: A maximum of 100 modules can be assigned to a single super module.

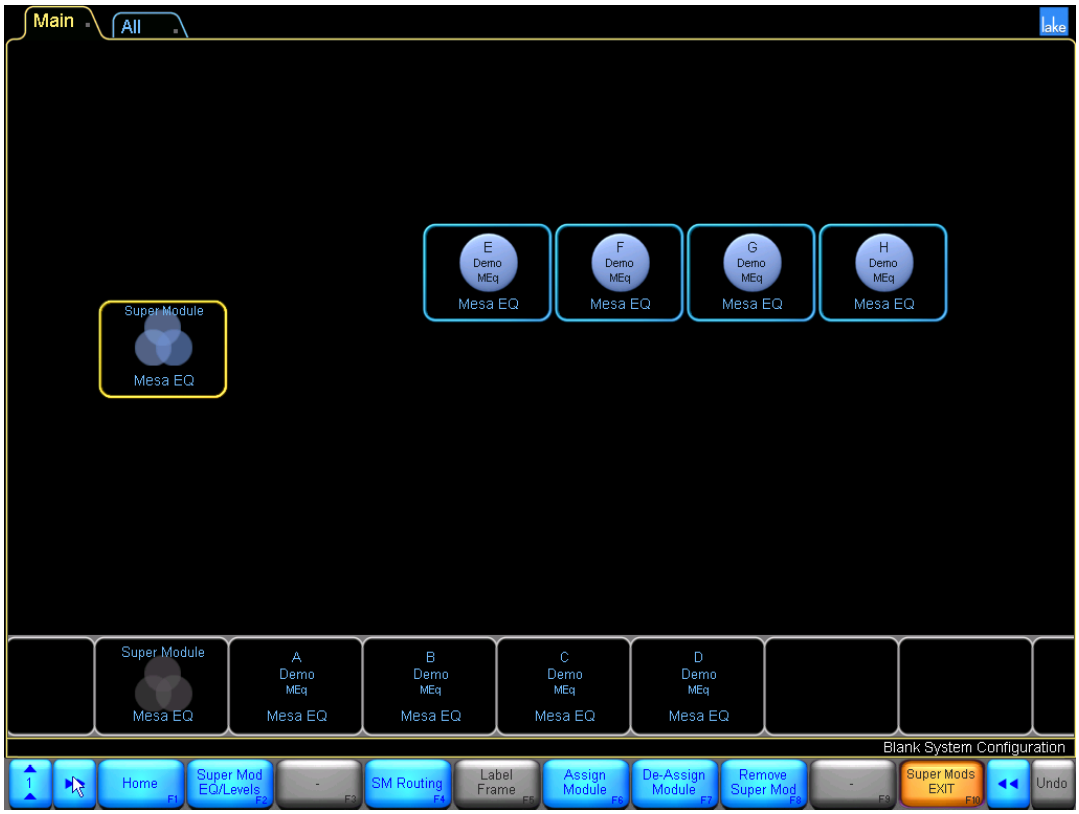
7.8.1 Assigning Super Modules

1. Tap **Modules**.
2. Select a module from the scrolling bar, and drag it to the main area.
3. Tap **Super Modules** from the **Modules** menu. A Venn icon that represents the combination of multiple modules appears in the scrolling bar.



4. Drag the Venn icon in the main area. The icon displays as a super module marked as empty.

5. Tap the empty super module to select it. Then tap **Assign Module** from the **Modules** menu. A message displays, warning you that group assignments of the first module assigned to a super module will be retained and transferred to subsequently assigned modules.
6. Tap the modules you want to be part of the super module. The modules are then assigned to the super module and removed from the main area. The modules contained in the super module appear in the scrolling bar when the super module is selected.



7.8.2 Super Module EQ/Levels or Module EQ/Levels

These functions enable you to view or change the EQ levels of a module or super module. When a module is selected, you change only the EQ and level of that module. When a super module is selected, you change the EQ and level for all modules contained in that super module. See Chapter 5 for more information on EQ levels.

To view the EQ levels of a module or super module:

1. Tap the module or super module to select it.
2. Tap **Super Mod EQ/Levels** or **Module EQ/Levels**. A **PEQ1** tab displays equalizer parameters and specific levels. It also contains a **Frequency Lock** button and an **A/B** button.

7.8.3 SM Routing: I/O Config

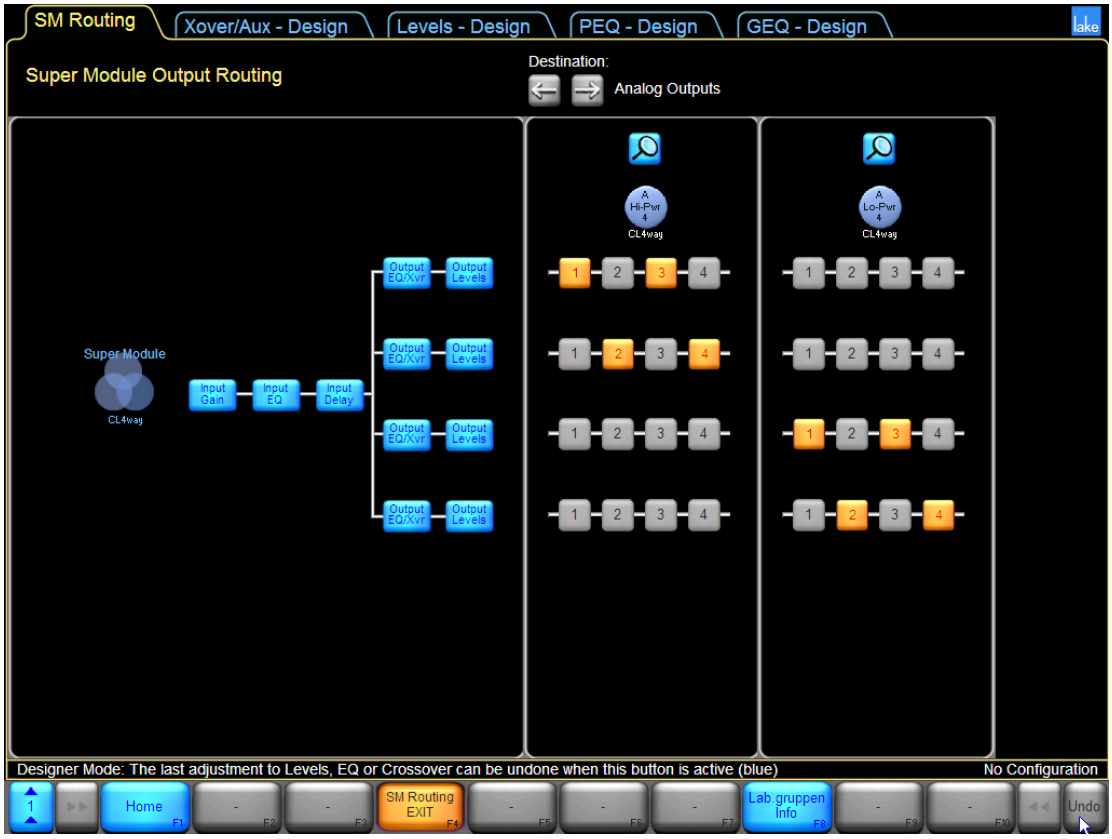
The SM Routing function displays the super module output routing pop-up window. It shows each of the elemental modules contained in the super module and its available output routing options.

To route a super module:

1. From **Home**, tap **Modules**.
2. Select a Super Module in the main area.
3. Tap **SM Routing**. The **Super Module Output Routing** screen appears.

Note: **I/O Config** is displayed when a module is selected.

The example below shows a stereo Classic 4-Way configuration split across two Lab.gruppen PLM amplifiers. The sub and low channels are being driven by one amplifier, and the mid and high channels by a separate amplifier.



With this super module configuration, two 4-way speakers can be controlled simultaneously via one super module icon, with all changes to levels, EQ and crossover being duplicated in real time across both separate amplifiers.

The Destination arrow icons enable you to scroll through the list of available output types.

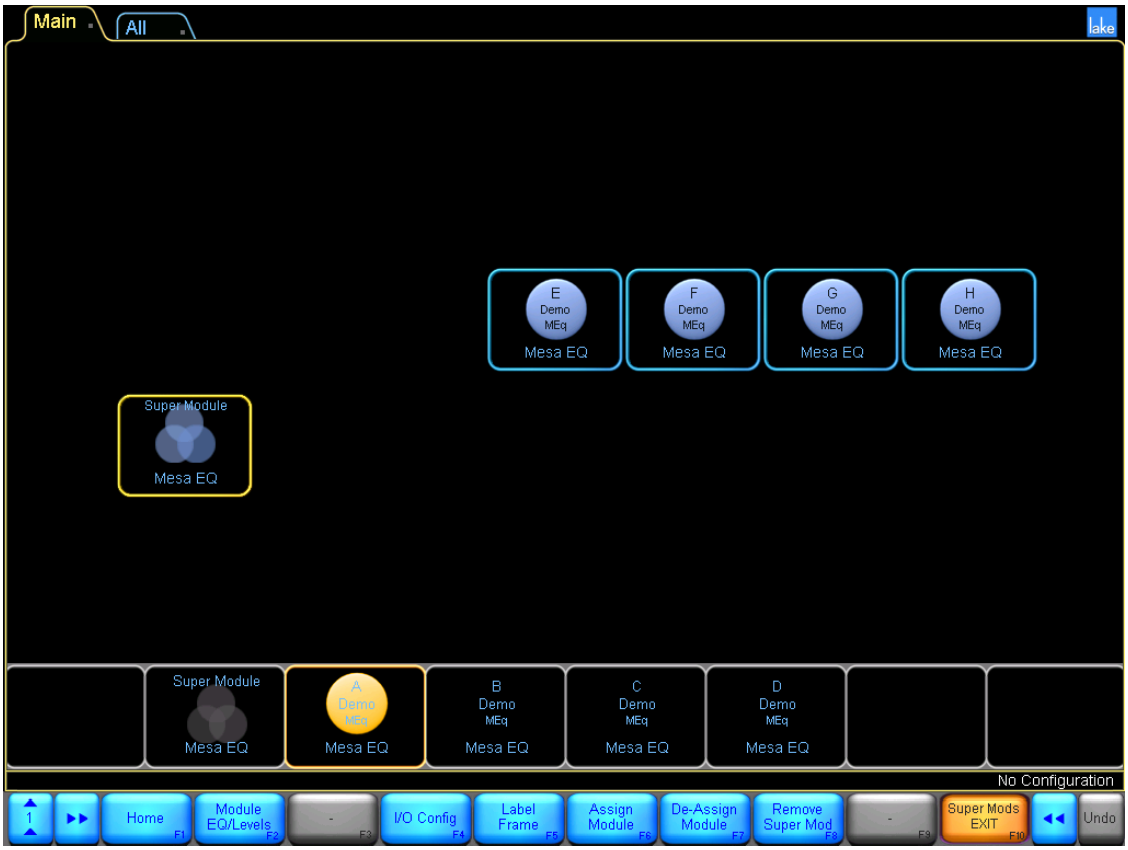
The magnifying glass icon enables you to retrieve the **I/O Config** screen. See Section 3.3.6 for details about this screen.

The **SM Routing** screen is divided into two sections. The left section contains buttons that access the super module settings. The right section displays output configuration information for each module.

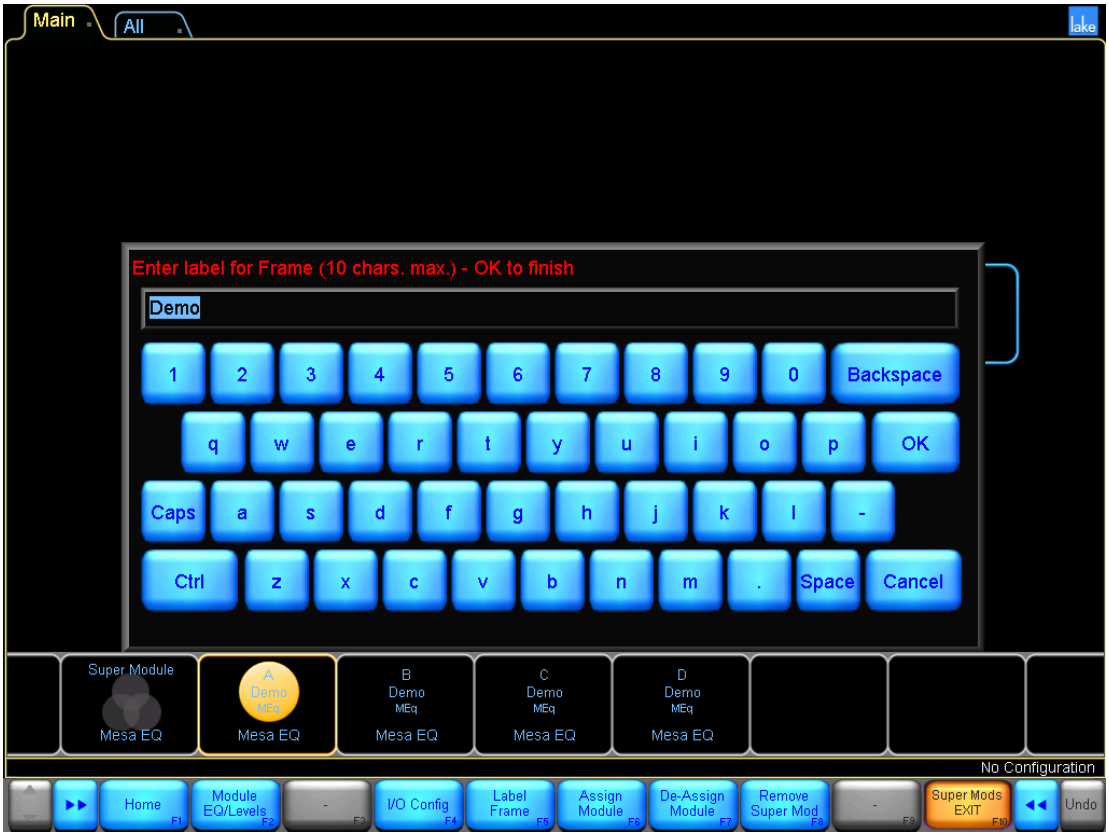
7.8.4 Label Frame

To label a frame, perform the following steps:

1. Select a module of a frame in either the work area or in the super module scroll bar if a super module is selected (as shown in the following screenshot).



2. Tap **Label Frame**. A keyboard displays.

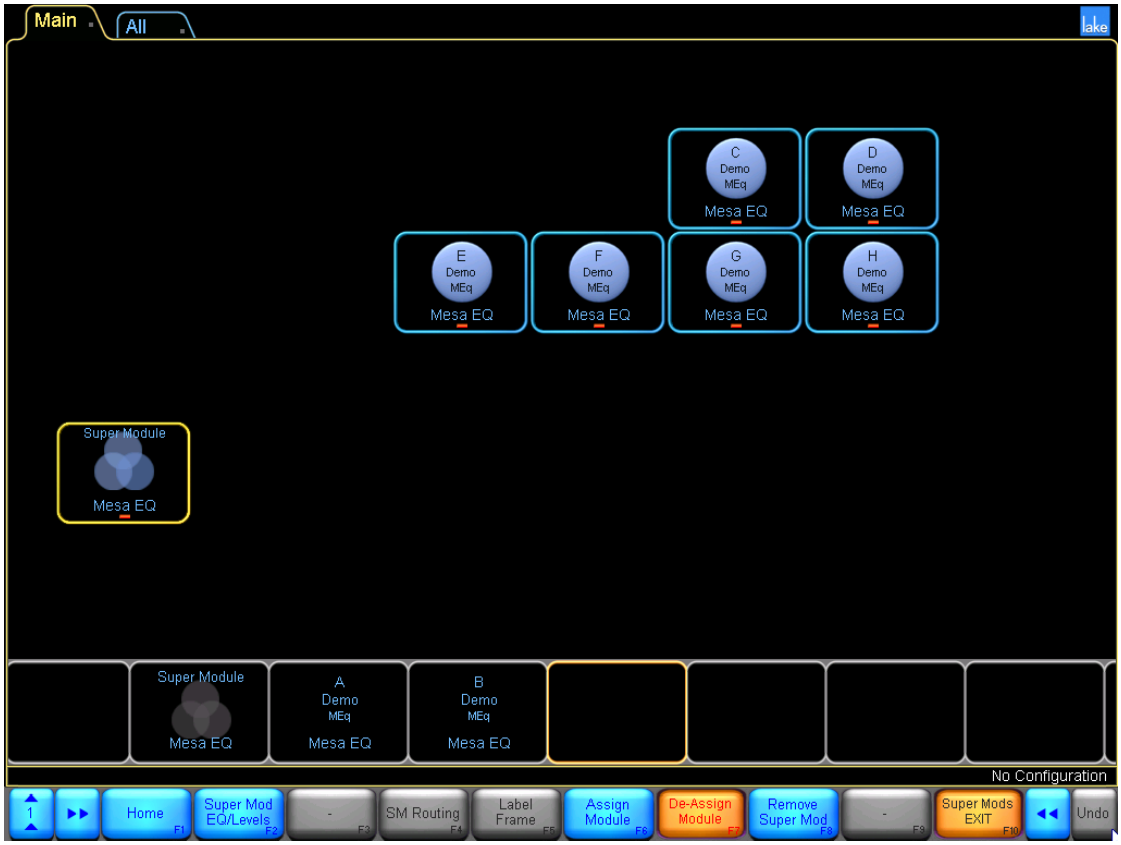

Main
All
Enter label for Frame (10 chars. max.) - OK to finish
Demo
1 2 3 4 5 6 7 8 9 0 Backspace
q w e r t y u i o p OK
Caps a s d f g h j k l -
Ctrl z x c v b n m . Space Cancel
Super Module
Mesa EQ
A Demo MEq Mesa EQ
B Demo MEq Mesa EQ
C Demo MEq Mesa EQ
D Demo MEq Mesa EQ
No Configuration
Home
Module EQ/Levels
I/O Config
Label Frame
Assign Module
De-Assign Module
Remove Super Mod
Super Mods EXIT
Undo

3. Enter the name, and tap **OK**. The label displays in the frame.

7.8.5 Deassigning a Super Module

To deassign a super module:

1. Tap the super module you want to deassign. The scrolling bar displays the modules inside the super module.



2. Tap **De-Assign Module**.
3. Tap the module icons on the scrollbar to remove them from the super module.

7.8.6 Remove Super Module

To remove a super module:

1. Tap the super module you want to remove.
2. Tap **Remove Super Mod**. A message appears, warning you that removing the super model disassociates it with all the modules currently assigned to it.
3. Tap **Yes** to proceed. The super module disappears.

Note: You can also remove a super module by selecting it and dragging it off to the scrollbar.

Module File Types

The Dolby® Lake® Processor provides two distinct categories of crossovers: Classic Bessel, Butterworth, and Linkwitz-Riley crossovers are available with rolloff ranging from 6 dB/octave to 48 dB/octave. Additionally, the Processor provides unique Linear Phase Brick Wall crossovers providing zero phase shift with steep transition slopes. Mesa EQ™ module files round out Processor functionality, providing files that enable system equalizer processing.

Signal processing can be configured in various ways to maximize the use of the inputs and outputs. Auxiliary Outputs initially provide full-bandwidth signal, which can be configured using HPF/LPF filters and output-specific EQ.

This chapter provides a detailed reference for all the Processor module files. Default module files are located in the **Default Modules** folder and can be accessed and recalled utilizing the **Module Store/Recall** button bar.

8.1 Module Type Abbreviations

Table 8-1 describes the Module Type abbreviations as shown on the module icon.

Table 8-1 Module Type Abbreviations

Abbreviation	Description
1	1 Auxiliary Output
2	Classic 2-Way Crossover or 2 Auxiliary Outputs
2+1	Classic 2-Way Crossover + 1 Auxiliary Output
LP2	Linear Phase 2-Way Crossover + 1 Auxiliary Output

Abbreviation	Description
3	Classic 3-Way Crossover or 3 Auxiliary Outputs
3+1	Classic 3-Way Crossover + 1 Auxiliary Output
LP3	Linear Phase 3-Way Crossover
4	Classic 4-Way Crossover or 4 Auxiliary Outputs
LP4	Linear Phase 4-Way Crossover
5	Classic 5-Way Crossover or 5 Auxiliary Outputs
6	Classic 6-Way Crossover or 6 Auxiliary Outputs
Ins	Stereo Insert module provides Stereo Digital Input/Output or Stereo Analog Input/Output. Available on Lake Contour™ Pro26D only.

8.2 Classic Crossovers/Auxiliary Outputs

This section describes the available combinations of Classic crossovers and shows the default signal path for each configuration.

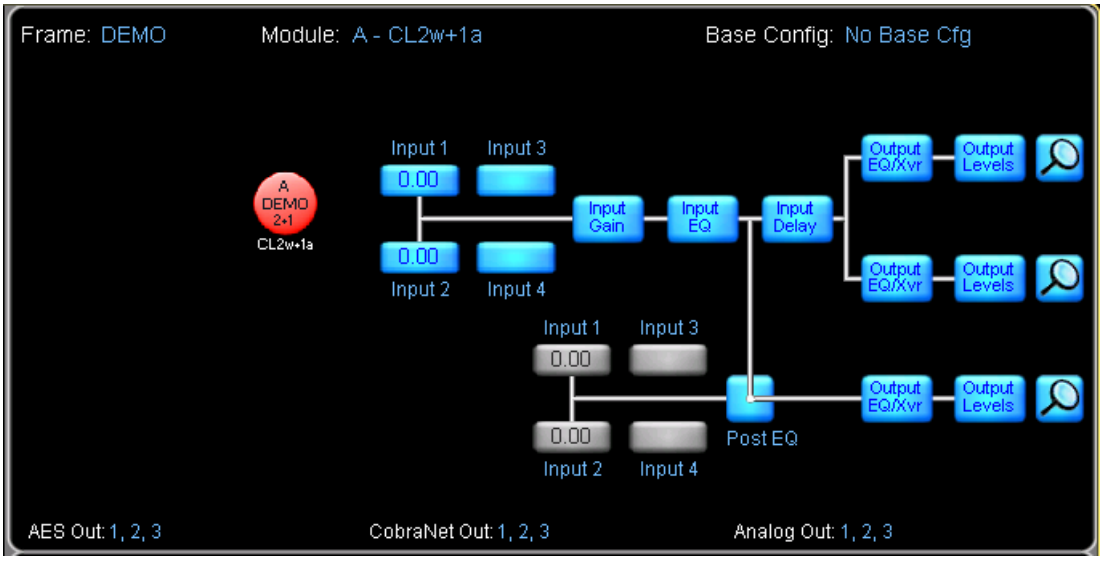
Classic 2+1, 2-Way, 3-Way, and 3-Auxiliary modules may be used in any combination on the Dolby Lake Processor. Linear Phase 2-Way and 3-Way modules may also be loaded in any combination with Classic crossover modules.

Classic 3+1, 4-Way, 5-Way, and 6-Way modules consume more than one module's worth of processing. In most cases, the remaining outputs of the Processor can be configured to provide other crossovers and auxiliary outputs.

8.2.1 Stereo Classic 2-Way (+ Auxiliary Outputs)

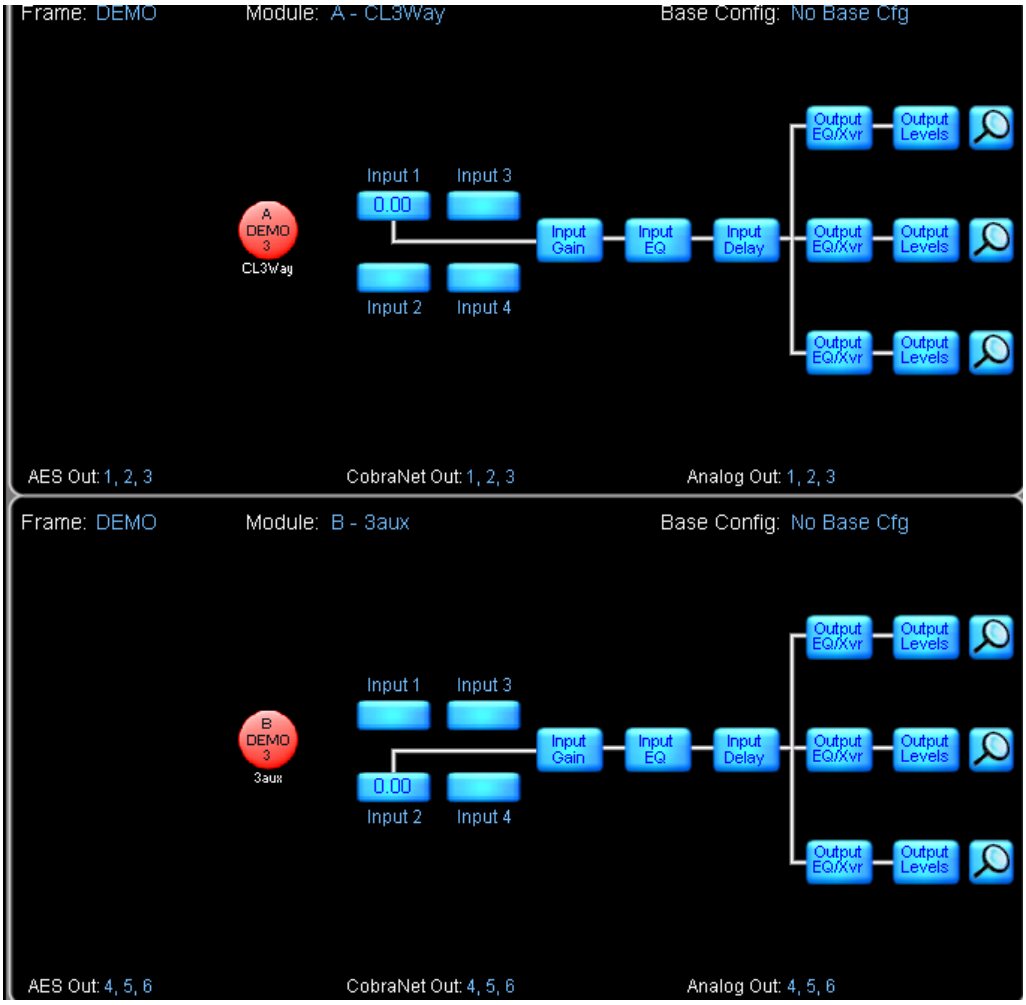
The CL2w+1a module provides an auxiliary output that can be driven by the post-input EQ signal, or its own independent input mix. By default, the auxiliary output is driven by the post-input EQ signal.

If you switch the auxiliary channel to receive input from its own input mixer, the auxiliary channel will no longer be muted by the module input mute control. The auxiliary channel can be muted by the channel's output mute control.



To change the auxiliary output to receive its own independent input mix, tap the switch selector box labeled **Post EQ**.

8.2.2 Classic 3-Way/3 Auxiliary Outputs



The signal paths for both these modules look similar, but the Classic 3-Way (shown in module **A**) has a single crossover page providing specific frequency bands from each output.

The 3 Auxiliary Outputs module provides three full-bandwidth channels per module. Each of these outputs can be configured independently as required using traditional highpass and lowpass filters, which are available on each independent Auxiliary Output page.

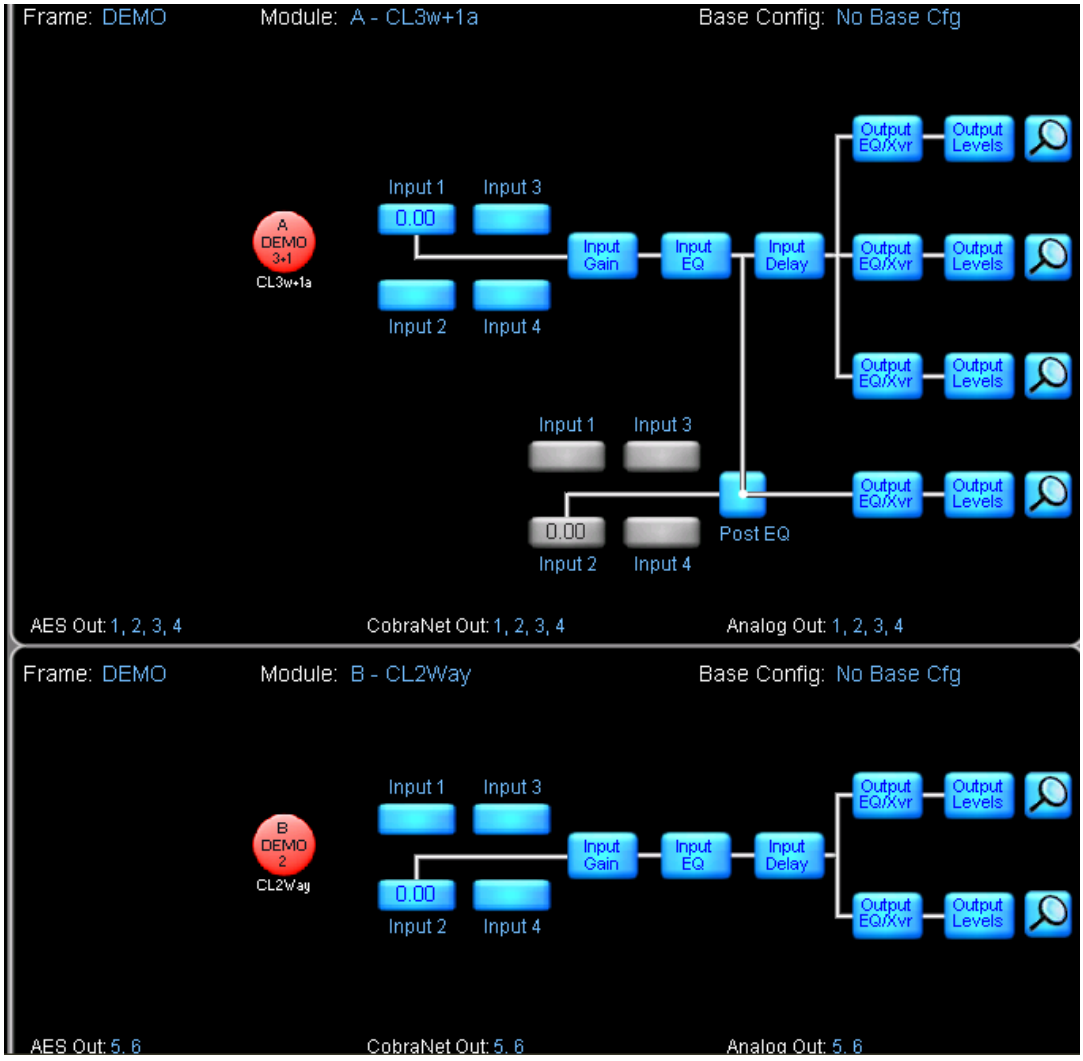
Note: The Classic 2-Way, Classic/Linear Phase 2-Way + 1 Auxiliary Output, Classic/Linear Phase 3-Way, and Classic 3-Auxiliary Outputs modules can be used in any combination on all available modules.

8.2.3 Classic 3-Way + 1 Auxiliary Output (with Classic 2-Way/2-Aux)

The Classic 3-Way + 1 Auxiliary Output (CL3w+1a) module allows the remaining two output channels to be configured as either Classic 2-Way or 2-Auxiliary Outputs.

Separate input EQ (PEQ/GEQ) is available for the CL3w+1a and the 2-Way/2-Aux modules.

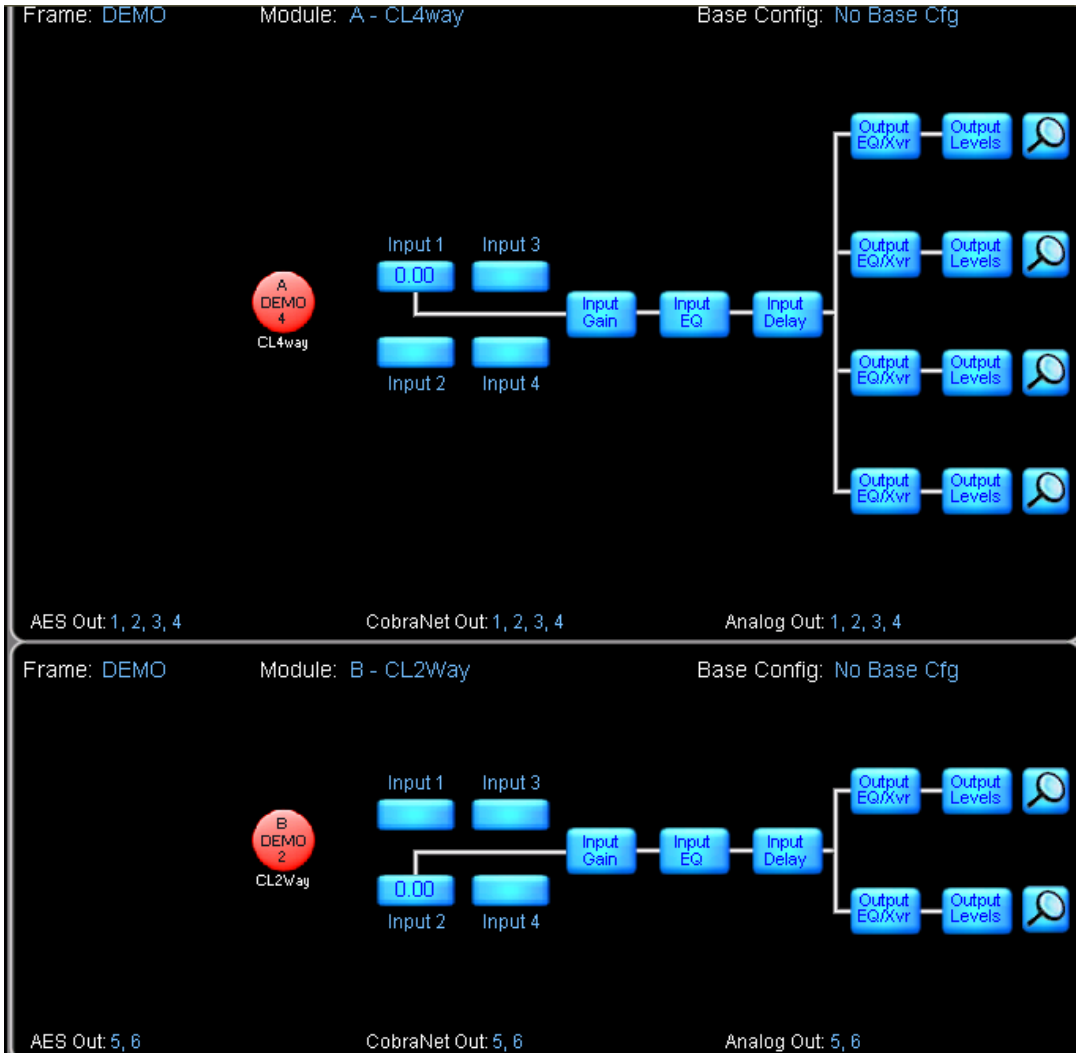
As with the Classic 2-way + 1 Auxiliary Output modules, the Auxiliary channel on the CL3w+1a can be fed Post Input EQ, or from its own independent Input Mixer.



8.2.4 Classic 4-Way/4-Aux (with Classic 2-Way/2-Aux)

The Classic 4-Way (CL4way) or 4 Auxiliary Outputs (4aux) modules allow the remaining two output channels to be configured as either Classic 2-Way or 2-Auxiliary Outputs.

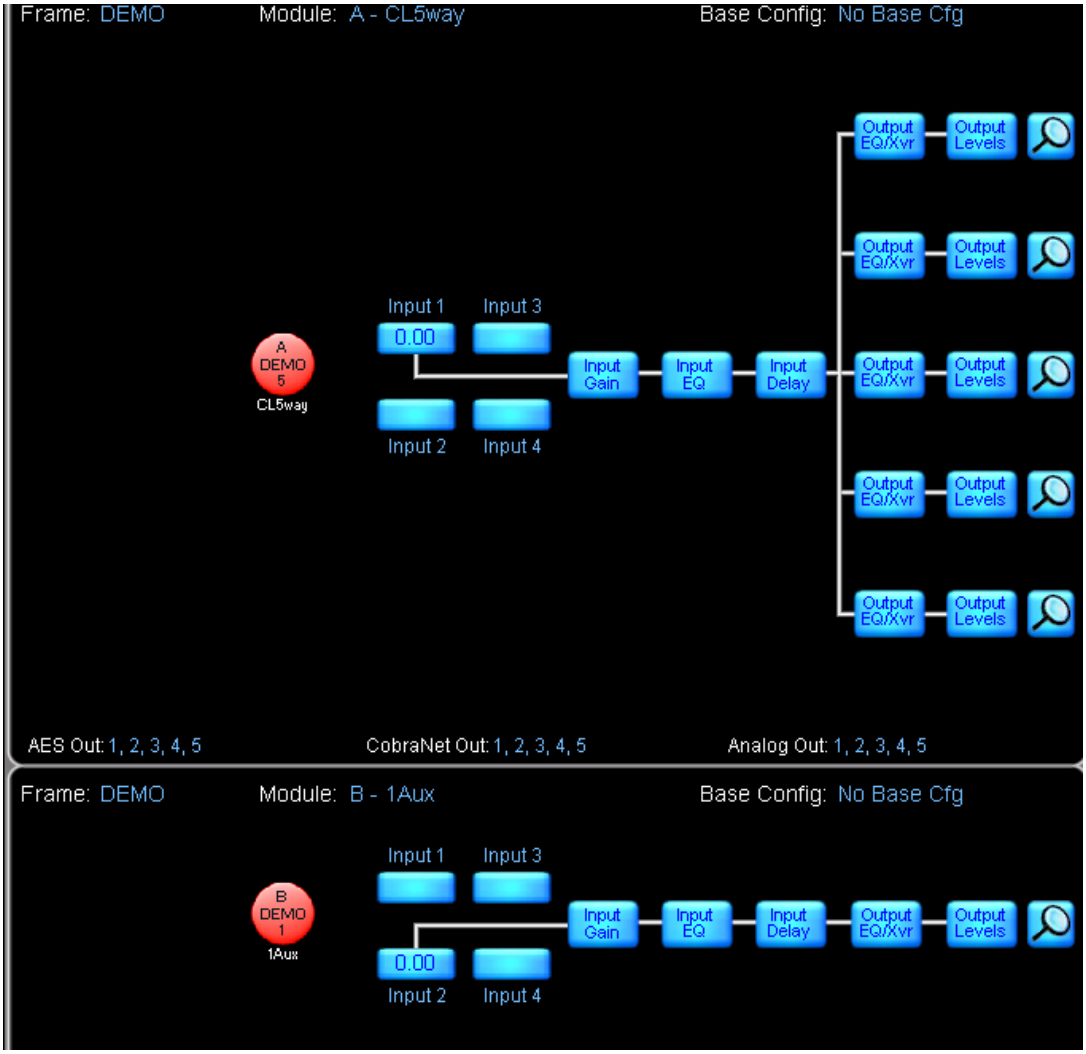
Separate input EQ (PEQ/GEQ) is available for the Classic 4-Way/4-Aux and the 2-Way/2-Aux modules.


Frame: DEMO
Module: A - CL4way
Base Config: No Base Cfg
A
DEMO
4
CL4way
Input 1
Input 3
0.00
Input 2
Input 4
Input Gain
Input EQ
Input Delay
Output EQ/Xvr
Output Levels
AES Out: 1, 2, 3, 4
CobraNet Out: 1, 2, 3, 4
Analog Out: 1, 2, 3, 4
Frame: DEMO
Module: B - CL2Way
Base Config: No Base Cfg
B
DEMO
2
CL2Way
Input 1
Input 3
0.00
Input 2
Input 4
Input Gain
Input EQ
Input Delay
Output EQ/Xvr
Output Levels
AES Out: 5, 6
CobraNet Out: 5, 6
Analog Out: 5, 6

8.2.5 Classic 5-Way/5-Aux (with 1-Auxiliary Output)

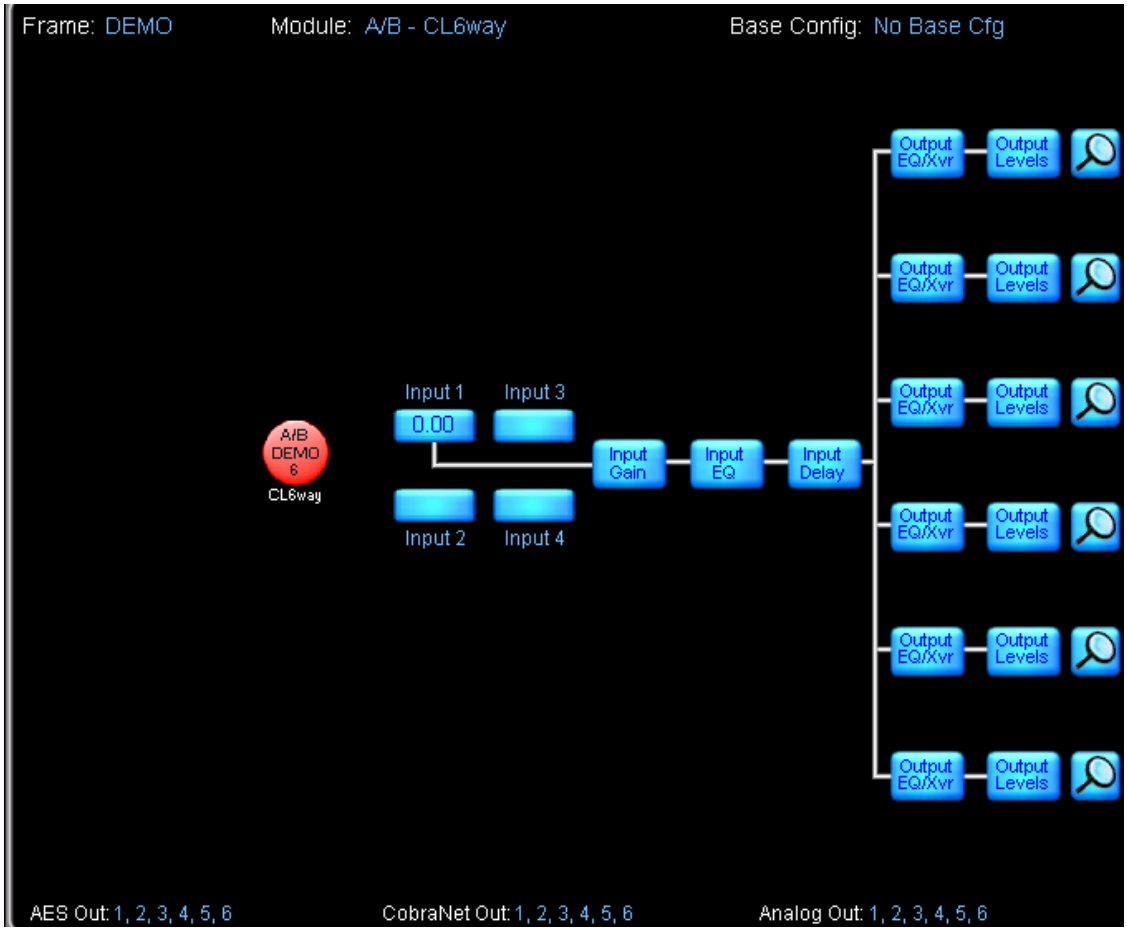
The Classic 5-Way (CL5way) or 5 Auxiliary Outputs (5aux) module provides an auxiliary channel on output 6.

Separate input EQ (PEQ/GEQ) is available for the Classic 5-Way/5-Aux and the 1-Auxiliary (1aux) Output modules.



8.2.6 Classic 6-Way/6-Auxiliary Outputs

The Classic 6-Way (CL6way) or 6 Auxiliary Outputs (6aux) modules can use any combination of input signal, which is split to all six output channels. The Classic 6-Way is shown here:

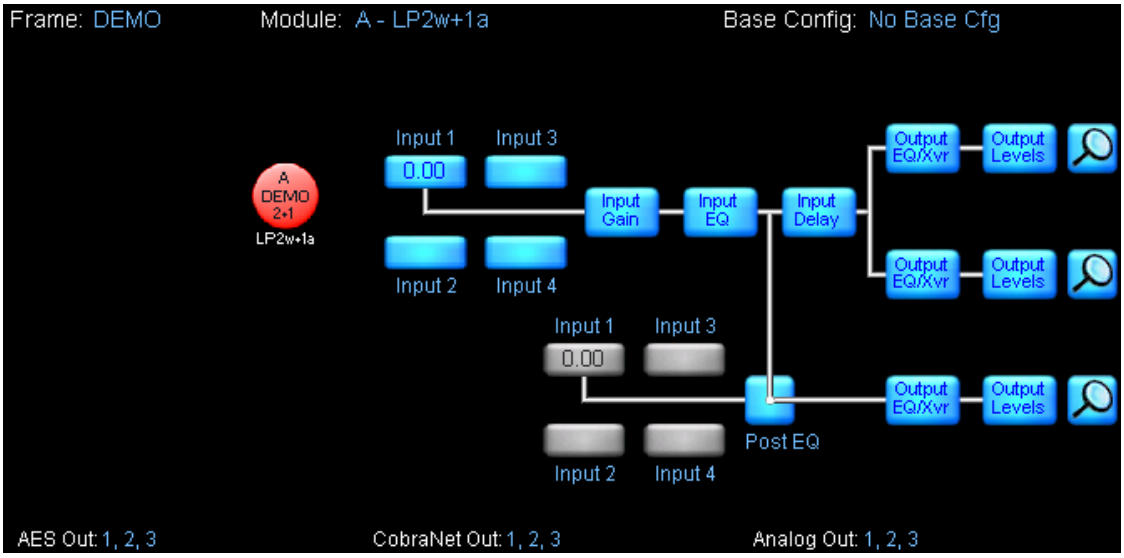


8.3 Linear Phase Crossovers

Linear phase crossovers provide steep transition slopes with zero phase shift. Linear phase crossovers are available in two-, three-, and four-way module types.

8.3.1 Linear Phase Brick Wall 2-Way (+1 Classic Auxiliary Output)

The Linear Phase Brick Wall 2-Way (LP2way) provides an auxiliary channel with traditional HPF/LPF for each module (LP2w+1a).



The LP2way uses significant processing power to create the steep crossover with flat phase response. For this reason, the full amount of output-specific EQ filters can be used only if the MaxPeak Limiter is disabled on the module, as the MaxPeak Limiter also requires a large amount of processing.

The MaxPeak Limiter process is disabled when the total MaxPeak level (including Group and Factory settings) is 25 dBu or greater.

The following crossover EQ filters for the LP 2-way + 1 Aux are available:

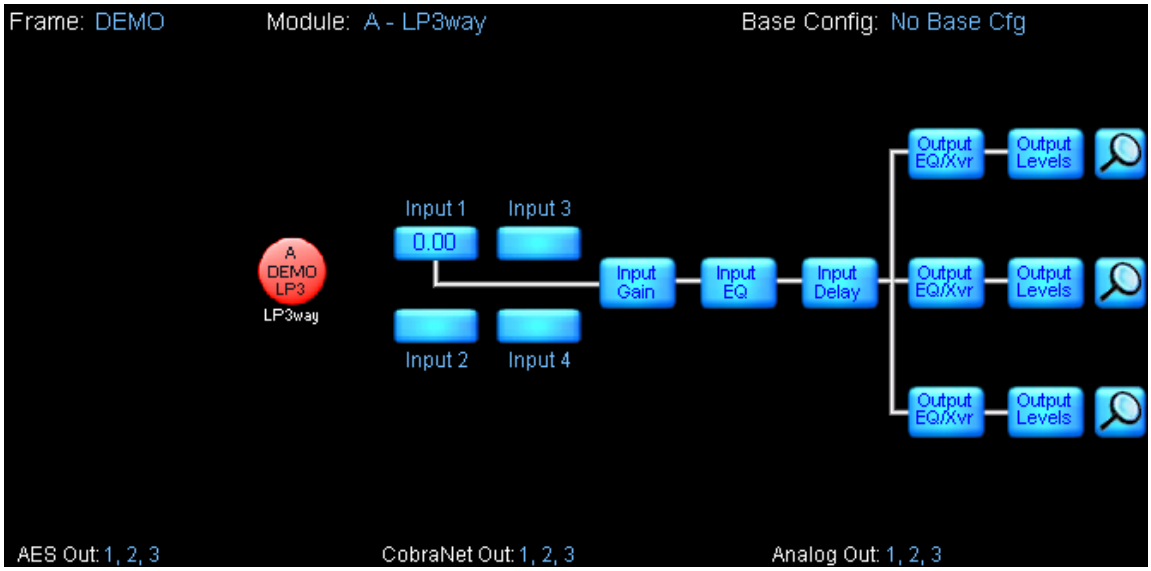
MaxPeak Activated: 16 EQ Filters + Highpass Filter

MaxPeak Deactivated: 21 EQ Filters + Highpass Filter

Note: The Classic/Linear Phase 2-Way (+1 Aux), Classic/Linear Phase 3-Way, and Classic 3-Auxiliary Outputs modules can be used in any combination on available modules.

8.3.2 Linear Phase Brick Wall 3-Way

The Linear Phase Brick Wall 3-Way (LP3way) has a similar signal path to the Classic 3-Way (CL3way).



As with the LP2way, the LP3way uses a significant amount of processing power to create steep crossovers with flat phase response. For this reason, the full amount of output-specific EQ filters can only be used if the MaxPeak is disabled on the module, as the MaxPeak Limiter also requires a large amount of processing.

The MaxPeak Limiter process is disabled when the total MaxPeak level (including Group and Factory settings) is 25 dBu or greater.

The following crossover EQ filters for the LP3way are available:

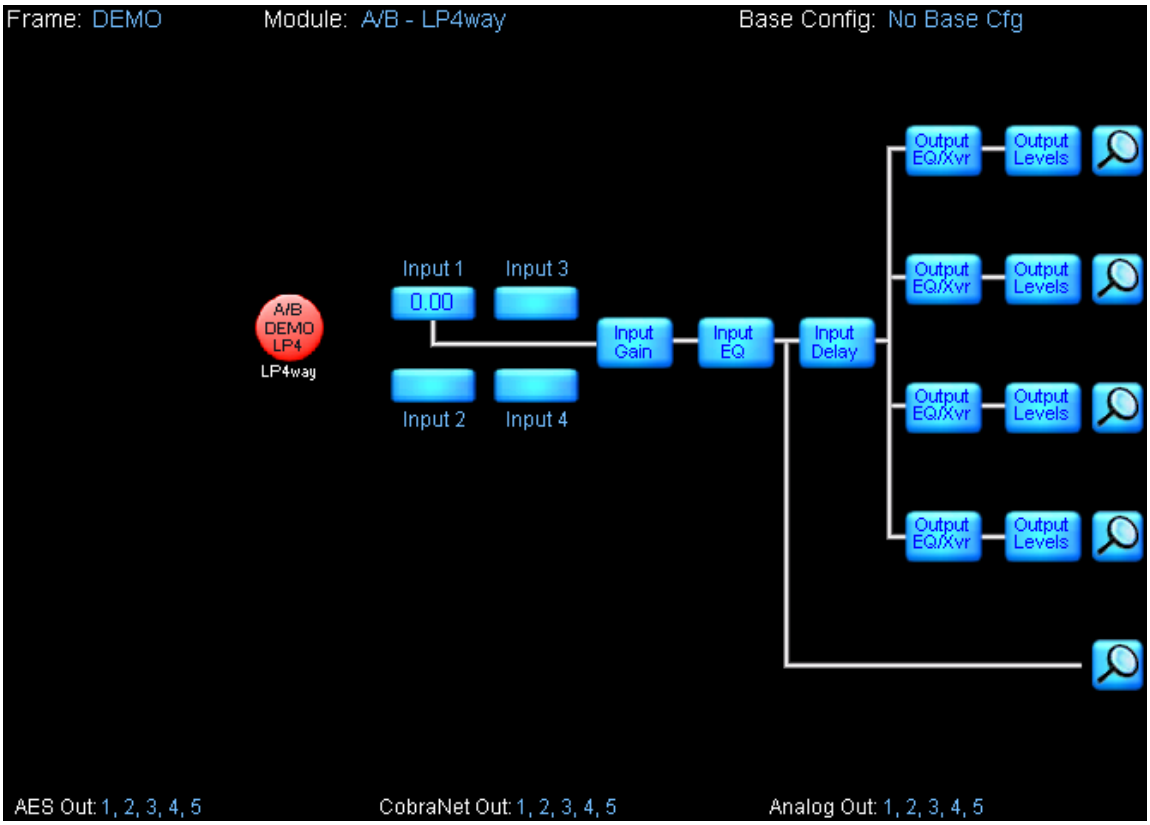
MaxPeak Activated: 10 EQ Filters + Highpass Filter

MaxPeak Deactivated: 15 EQ Filters + Highpass Filter

Note: The Classic/Linear Phase 2-Way (+1 Aux), Classic/Linear Phase 3-Way, and Classic 3-Auxiliary Outputs modules can be used in any combination on modules **A** and **B**.

8.3.3 Linear Phase Brick Wall 4-Way

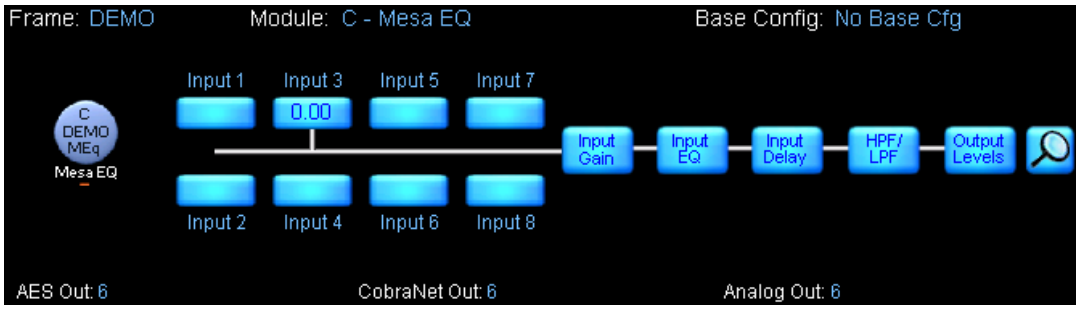
The Linear Phase Brick Wall 4-Way (LP4way) uses the processing power of two modules to create extra-steep crossovers.



8.4 Mesa EQ Module

The Mesa EQ module type is abbreviated as MEq on the module icon.

The default signal path for a Mesa EQ module is shown in the following screenshot:



The Mesa EQ module provides an eight-channel input mixer, in addition to the other signal processing functions previously detailed in this chapter. Instead of a crossover display, the Mesa EQ has an HPF/LPF display for inserting and configuring lowpass and highpass filters.

Groups: Menu Reference

Groups provide powerful control over all modules in a system. Modules can be assigned to multiple groups, and each module can be a member of up to 28 different groups.

Groups enable several important functions, including the following:

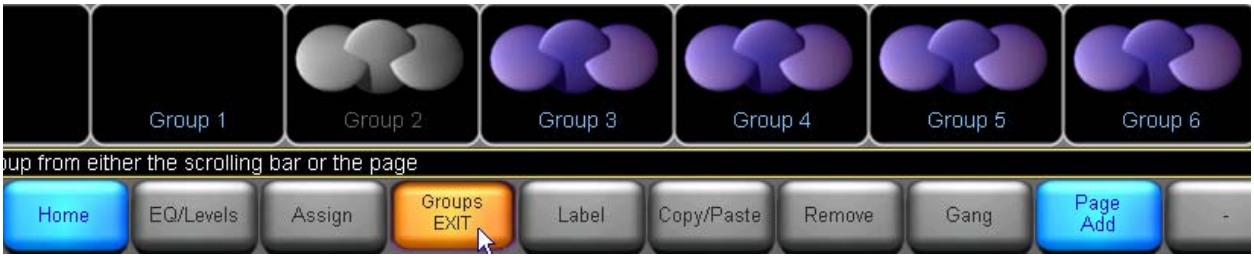
1. Master EQ and Levels control over an entire system
2. EQ and Levels control over subsections of a system (for example, speaker clusters)
3. HPF/LPF/Crossover/Auxiliary Output ganging, allowing a change to a crossover or output-specific EQ to be reflected across all modules of the same type within the group
4. Simplified control over multiple speakers or zones

Once your speakers are configured, the modules that control the detailed individual response for each speaker can be protected with the access privileges and security provided by Designer Mode, or placed on a separate page, leaving groups to simplify the overall control of the audio system.

You can use multiple groups to logically partition a large-scale loudspeaker system. Group all modules driving the left loudspeaker array to create a left submaster. Create groups for the center cluster, the right loudspeaker array, and any side-fill, down-fill, front-fill, and delay systems. Then create a single master group to enable a system-wide interface for EQ and Levels, making instant adjustments to all hardware processors on a distributed network system with a single tap.

9.1 Adding a Group

Tap the **Groups** button from the **Home** menu. The available group icons appear in the scroll bar. Most options in the button bar appear gray and are inactive until a group is moved from the scroll bar to the **Main** page.



The **Groups** scroll bar and menu show the status of different group icons while on the scroll bar.

- Group 1 (empty) is being used in the current system configuration.
- Group 2 (gray) is assigned to a module that is not a part of the current system configuration.
- Groups 3 through 28 are available for use and are not currently assigned to any other modules.
- Tap and drag the scroll bar to the left/right or tap the ▶▶ or ◀◀ buttons to access additional group icons.

To add a group to your system configuration, perform the following steps:

1. Tap a group icon on the scroll bar. The cursor changes to the group icon.
2. Tap the **Main** page to add the group to your system configuration.
3. Follow the instructions in Section 9.3 to assign modules to the group.

9.2 EQ/Levels

Tap the **EQ/Levels** button from the **Groups** menu to display the parametric EQ, graphic EQ, and Levels screens for the selected group. This function is active only when a group is selected in the work area.

Module level limits are always adhered to when group levels are changed. If one module in the group would exceed its level limit as a result of a change to group data, then the change will not be allowed. The following example demonstrates the relationship between module level limits, module levels, and group levels.

Note: Level limits can be adjusted in Designer Mode.

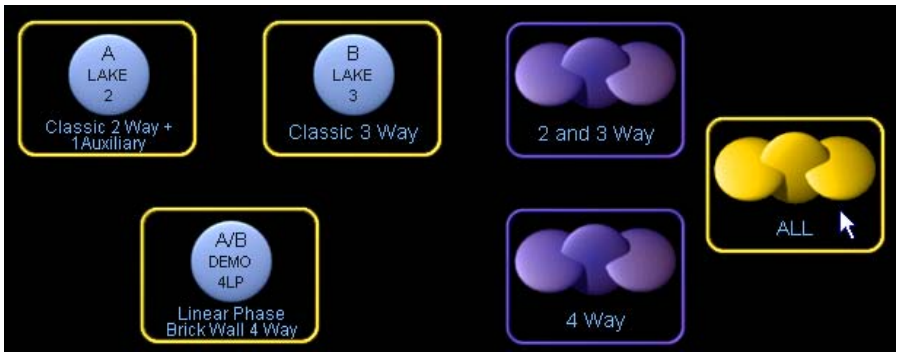
9.3 Assign

Changes made to the group EQ/Levels affect only those modules assigned to that group. Before assigning modules to a group, make sure the required modules and groups are in the work area and navigate to the **Groups** menu.

To assign modules to a group, perform the following steps:

1. Tap the **Assign** button to activate the function.
2. Tap a group icon. The icon illuminates yellow.
3. Tap each module icon you wish to assign to that group. Each module icon's border illuminates yellow indicating it is assigned to the selected group.
4. Tap the **Assign** button again to deactivate the function.

Module group assignments can be verified by selecting a group icon in the work area. The selected group and associated module icons will display yellow borders.



Note: Modules will not allow any group, or any combination of groups, to exceed its minimum or maximum limits. Warning messages will be displayed if a group assignment would cause the module to exceed its level limits.

The first module that is assigned to the group will be used by the group for level metering purposes. This metering assignment can be changed at a later stage if required; please refer to Section 5.2.8 for further details on the **Assign Meters** function.

9.4 Label

The group label is a user-defined value at the bottom of the group icon that is useful for identifying the part of the sound system to which the group communicates (front of house, monitors, down-fill, and so on).

To label a group, perform the following steps:

1. Tap the desired group icon.
2. Tap **Label** and enter a group label.
3. Tap **OK**.

9.5 Copy/Paste

Select a group from the **Main** page, and tap the **Copy/Paste** button to view a submenu that transfers attributes between groups.

9.5.1 Copy

The **Copy** button is active only when a group icon is selected.

To copy data from a group, perform the following steps:

1. Tap the group icon that contains the data to copy.
2. Tap **Copy**.

9.5.2 Paste

The **Paste** button is active only when group data has been previously copied and a group icon is selected.

To paste data to a group, perform the following steps:

1. Tap the group icon in which to paste the copied data.
2. Tap **Paste**.

Note: The Paste operation overwrites all the destination group's EQ and Levels settings, but not the name or module assignments.

9.6 Remove

This function removes the selected group from the current system configuration.

To remove a group, perform the following steps:

1. Tap the group icon to be removed.
2. Tap **Remove**.
3. Confirm the action by selecting **Yes** in the warning message.

The warning message is displayed only if the group has modules assigned to it. The group icon reappears in the scroll bar indicating it is not currently used.

Note: You can also remove a group from the configuration and release its modules by dragging the group icon to the scroll bar.

9.7 Gang

Tapping this button activates a scroll bar containing all modules currently assigned to the selected group, along with a submenu.

Gang Xover/Aux (Contour) or Gang HPF/LPF (Mesa EQ)

This function allows the crossovers, auxiliary output channels, and HPF/LPF settings of modules on different frames to be linked together. When Gang Xover/Aux is active on a group containing crossover modules, the crossovers, HPF/LPF, and auxiliary channels of all modules in the group are synchronized; a change made in one module will be reflected in all modules of that group. When Gang HPF/LPF is active on a group containing Mesa EQ™ modules, the HPF/LPF will be linked on all modules in the group.

To gang the crossover (or HPF/LPF) of all modules in a group, perform the following steps:

1. Assign the modules to a group. All modules must be of the same crossover type, such as Classic 3-Way (CL3way), for example.
2. From the **Groups** menu, tap **Gang**.
3. Tap the module on the scroll bar to select which module's settings will be transferred to all other modules in the group.
4. Tap **Gang Xover/Aux** (crossover modules) or **Gang HPF/LPF** (Mesa EQ modules).
5. Tap **Yes** to finish.

Note: Only the crossover/aux/HPF/LPF/output EQ data are ganged. Levels data and input EQ (PEQ/GEQ) are not ganged. Please use the Group function for master levels and EQ control across multiple modules.

To synchronize all data across multiple modules, you can use the powerful super module feature. See Section 7.8 for details.

9.8 Add Page

The **Add Page** function is always available from the **Groups** menu and creates additional pages that help manage large systems with many module and group icons.

Solo/Mute—Menu Reference

The functionality provided by the **Solo/Mute** menu provides an invaluable tool for the sound engineer during system setup and optimization. The **Solo** function allows you to choose a specific module or group and instantly mute the rest of the system. This allows for rapid measurement and analysis, including lobe studies in large, complex systems.

Tap the **Solo/Mute** button from the **Home** menu. This action displays a submenu with **Mute** and **Solo** functions for modules and groups.

10.1 EQ/Levels

Tap the **EQ/Levels** button from the **Solo/Mute** menu to display the parametric EQ, graphic EQ, Xover, and Levels screens for the selected module or group. This function is active only when a module or group icon has been selected.

Note: When Solo/Mute is enabled, EQ/Levels can only be accessed for a module that is in Solo mode.

The ability to access EQ/Levels from the **Solo/Mute** button bar is necessary because the Dolby® Lake® Controller will exit Solo/Mute mode when you navigate to other areas of the user interface. This is a safety feature to ensure that no modules or groups are left accidentally muted.

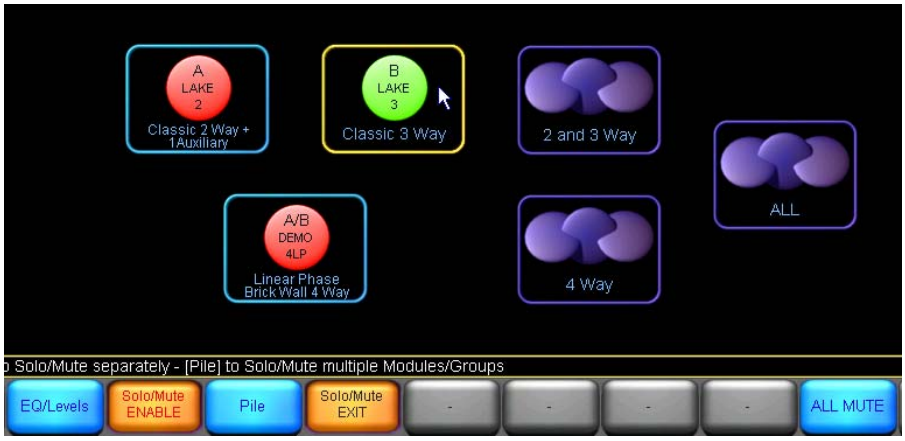
Additionally, context switching is also disabled to ensure that no modules or groups are left accidentally muted.

10.2 Solo/Mute Enable

Tap the **Solo/Mute Enable** button to toggle the **Solo/Mute** functionality on (orange) and off (blue). While the **Solo/Mute** function is on, icons are red when muted or green when in Solo mode. All modules default to Solo mode when Solo/Mute is first turned on.

Tap a module or group icon to keep Solo mode active on that module (or all modules in the selected group) and mute all other modules in the system. Tap the same icon again to unmute all modules.

The following figure shows module **B** of a frame in Solo mode. The other two module icons are muted through the Solo/Mute function.



10.3 Pile

The Pile function allows for multiple modules or groups to solo at the same time.

1. Tap the **Solo/Mute Enable** button from the **Solo/Mute** menu. The button illuminates orange.
2. Tap the **Pile** button. The button illuminates orange.
3. Tap a **Module** or **Group** icon to solo. Repeat for other modules or groups to solo.
4. Tap **Solo/Mute Enable** again to exit this function.

10.4 All Mute

To mute all modules in a system, perform the following steps:

1. Tap **Solo/Mute Enable** from the **Solo/Mute** menu. The button illuminates orange.
2. Tap the **All Mute** button.
3. Tap **Solo/Mute Enable** or **Solo/Mute Exit** to resume normal status.

Icon Control—Menu Reference

The functionality provided through the **Icon Control** menu allows you to configure the size of icons displayed on pages, and can also change icons to show input and output meters. You can configure pages to provide an overview of all modules on the network, providing a system-monitoring interface including both level and limiting activity.

11.1 Meters On/Off

This feature is active for modules and groups when an icon is selected. Meters on the icon display input and output levels, limiting, clipping, and the module label.

To toggle meters on and off:

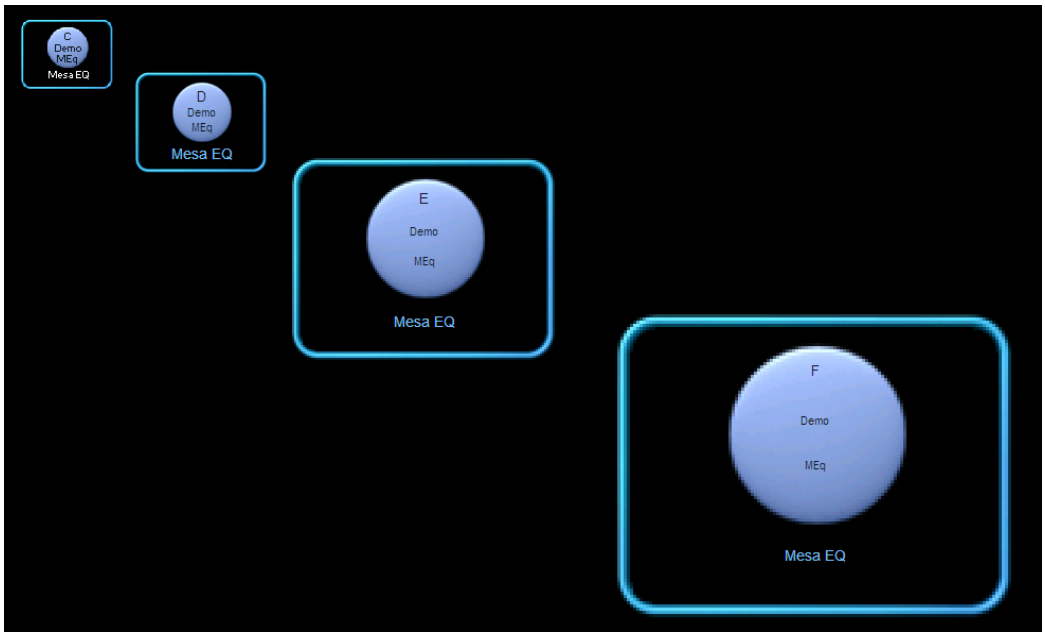
1. Tap **Icon Control** from the **Home** menu.
2. Tap **Meters On/Off**. The button illuminates orange.
3. Tap the module or group icon to toggle between **Meters On/Off**.
4. Tap **Meters On/Off** again to exit this mode.

The **Icon Small**, **Icon Normal**, **Icon Medium**, and **Icon Large** buttons described next are active only when a module or group icon is selected from the main work area and the Meters On/Off mode is not selected. (The **Meters On/Off** button is blue.)

11.2 Icon Small/Normal/Medium/Large

Tap the icon size buttons to change the size of the selected module or group icon.

The four icon sizes are shown in the following screenshot.



User Preferences—Menu Reference

The **User Preferences** menu provides a number of functions for customizing the Dolby® Lake® Controller to suit your particular application requirements.

Tap the **User Preferences** button from the **Home** menu to display a submenu containing functions and various additional menus. User Preferences functions change settings throughout the system.

12.1 Contexts

Contexts allow up to eight views to be stored and retrieved easily using the **Context** button, which is available on the far left of the button bar on most screens.

The **Context** menu enables selection of the number of views to be available throughout the system, along with the ability to disable the animation of the scroll bar when context is being changed.

To set up four contexts in your system, perform the following steps:

1. From **Home**, tap **User Preferences**.
2. Tap **Context**, then tap **4**.
3. Tap **Home**.
4. Navigate to the first screen you wish to view.
5. Tap a numbered context button (labeled A in the figure above) to move to the next context.
6. Repeat steps 4 and 5 until all four contexts are configured.

Tapping the **Context** button now allows you to switch instantly between these views.

Note: The last screen viewed is stored under the currently selected context.

12.2 Delay Units

The units used for setting delay levels defaults to milliseconds.

This menu provides the option for values to be entered and viewed in feet and meters. Tap the relevant button to change to your required default setting.

Delay calculations in meters and in feet are performed with the speed of sound being 343.6 meters per second. This is the speed of sound as calculated for an ambient temperature of 20 degrees Celsius.

12.3 Designer Functions

Designer functions provide a gateway to Designer Mode, an advanced mode of the Dolby Lake Controller that provides the engineer with the ability to secure various aspects of the user interface.

12.3.1 Change Password

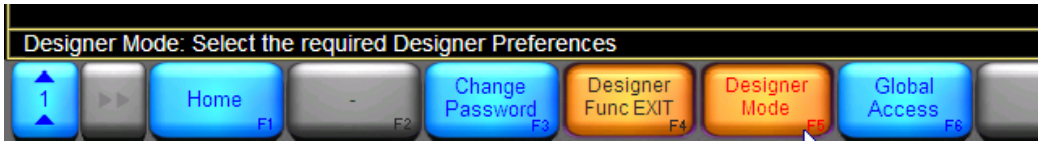
The Change Password function is active only when Designer Mode is on. It allows a system designer to password protect access to Designer Mode.

12.3.2 Designer Mode

Tap the **Designer Mode** button to toggle Designer Mode on (orange) and off (blue). With Designer Mode on, the user can access and adjust additional functions throughout the system, including the following:

- Global and Individual Overlay access security settings
- Crossover and HPF/LPF access security settings
- Hidden channels
- Factory settings and Level Limits

When Designer Mode is active, the text **Designer Mode** is displayed on the status bar of the Controller.



12.3.3 Global Access

The Global Access function is active only when Designer Mode is on. It allows a system designer to hide or set to **View Only** entire sections of the system. More detail is provided in Chapter 18.

12.4 Keyboard Shortcuts

The **Keyboard Shortcuts** button enables (orange) or disables (blue) keyboard shortcut functionality. For details on all available keyboard shortcuts, please refer to Chapter 16.

12.5 MIDI

The **MIDI** button displays a submenu with a scroll bar containing all available MIDI devices on your computer. To select or change the MIDI device you wish to use, tap the MIDI device icon on the scroll bar, and then tap the **Select MIDI Device** button.

Please refer to Section 17.2 for details regarding MIDI control.

12.6 About

Tap the **About** button to view the current Dolby Lake Controller software version. Tap anywhere on the display to close the **About** box.

12.7 Graphics

12.7.1 Auto Icon Arrange

This button is on by default, automatically placing icons so they do not overlap each other.

12.7.2 Screen Capture

This button turns the **Undo** button into a screen capture button, which stores a bitmap of any screen in the system to the **data/user/printout** folder in your Dolby Lake Controller installation directory.

12.7.3 Animate

This button is on by default, enabling various animation and graphic effects during use of the Dolby Lake Controller. For slower computers, we recommend disabling this feature.

12.7.4 Daylight Mode

Daylight Mode provides high-contrast graphics on a white background, making the Controller easier to view under daylight conditions.

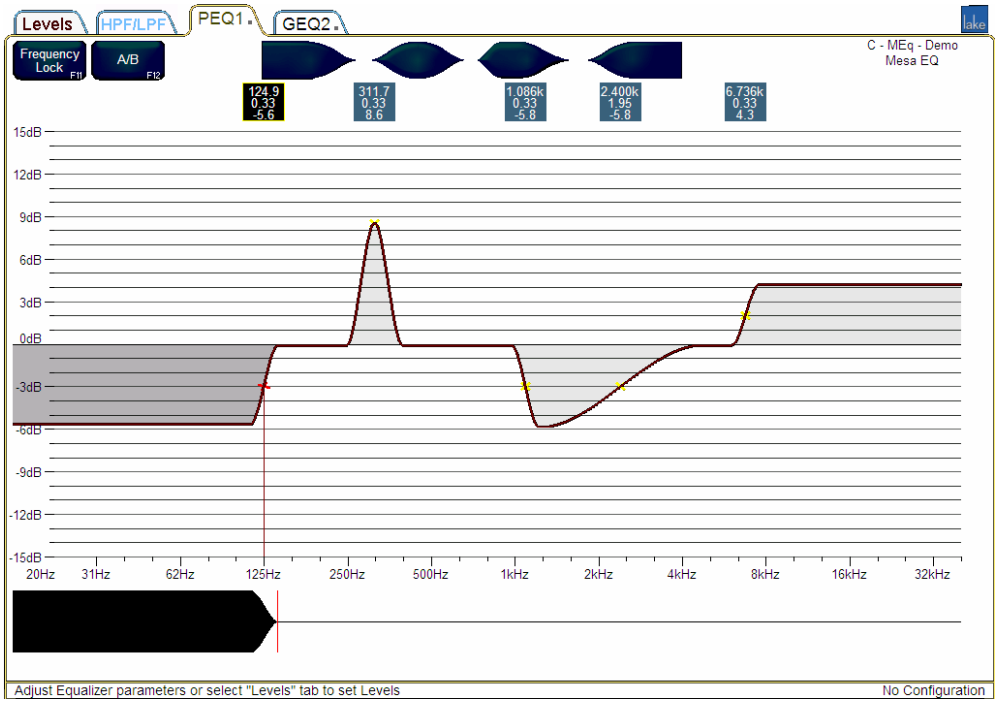


Figure 12-1 Controller in Daylight Mode

Tap the **Daylight Mode** button to toggle between normal graphics settings (black background) and Daylight mode (white background).

12.8 Show Mode

Tap the **Show Mode** button to toggle Show Mode on (orange) and off (blue). Show Mode should be activated during a show to prevent accidental changes.

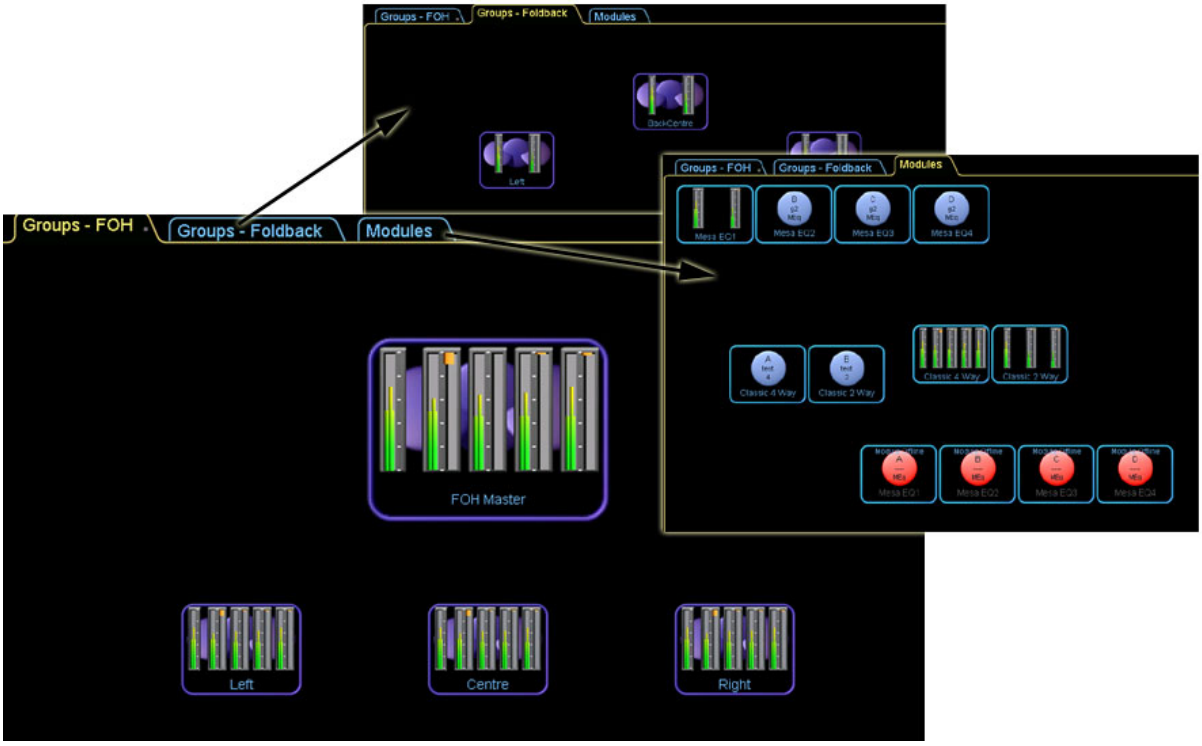
When Show Mode is on:

- Channel mute and polarity buttons are disabled on all Levels screens.
- Input Mixer and Input Mute controls are disabled.
- All changes to EQ and Levels are restricted to fine adjustments.
- All Xover screens become unavailable.
- All Home-level menu options are disabled except User Preferences and Network.

Pages: Menu Reference

Tap the **Pages** button from the **Home** menu to display a submenu with functions that manage the **Main** work area of the system, along with the module and group icons. The default system setting is one page labeled **Main**. Large systems with many modules and groups may require additional pages.

The functions described in this chapter may be used to manage pages and copy or move icons across the pages. The following example shows a configuration containing three pages: one containing groups for main front-of-house EQ and Levels, another for monitor EQ and Levels, and another to store all the module icons.



13.1 Cut Icon

The **Cut Icon** button is active only when a module or group icon is selected.

To move an icon from one page to another, perform the following steps:

1. Tap a module or group icon on the work area.
2. Tap **Cut Icon**.
3. Select another page using the tabs at top of the screen, or tap **Add Page** if no other pages exist.
4. Tap **Paste Icon**.

13.2 Copy Icon

The **Copy Icon** button is active only when a module or group icon is selected. More than one copy of an icon can exist on different pages.

To copy an icon, perform the following steps:

1. Tap a module or group icon on the work area.
2. Tap **Copy Icon**.
3. Select another page using the tabs at top of screen, or tap **Add Page** if no other pages exists.
4. Tap **Paste Icon**.

Note: There can be only one copy of an icon on each page.

13.3 Paste Icon

The **Paste Icon** button is active only after a Cut Icon or Copy Icon action. When tapped, this button will paste a copy of the icon currently in memory to the currently selected page.

13.4 Page Label

The **Page Label** button is always active.

To label a page, perform the following steps:

1. Select the page to be labeled (top of screen).
2. Tap **Page Label**.
3. Enter the label using either the onscreen keyboard or an external keyboard.
4. Tap **OK**.

13.5 Page Delete

This function deletes the selected page, including all module and group icons, which return to the module and group scroll bars.

Note: The **Page Delete** button is inactive if the **Main** page or the **All** page is selected.

13.6 Page Add

Tap the **Add Page** button to add another page to the Dolby® Lake® Controller interface.

13.7 Page Hide

This button is active only in Designer Mode and is used for hiding pages. For further information, please refer to Chapter 18.

13.8 Scrolling Pages

The ◀◀ and ▶▶ buttons on the button bar activate if there are more pages than can fit across the screen. Tap these buttons to view pages that are currently out of view.

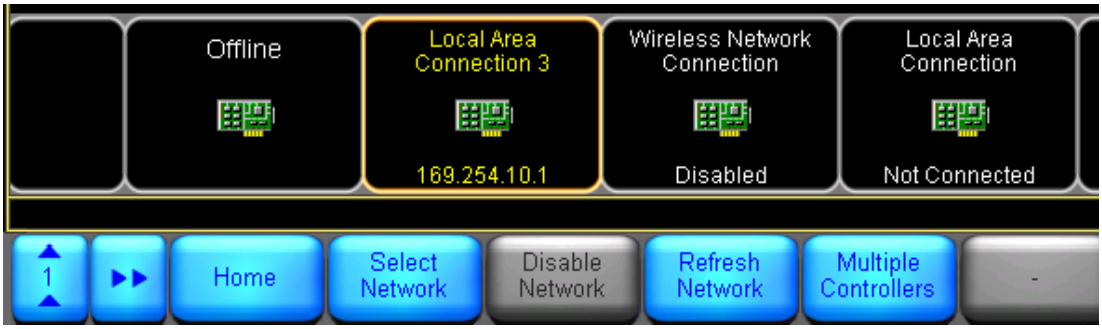
Network—Menu Reference

The **Network** menu provides functionality for changing the currently selected network, and also provides the interface for enabling multiple Controllers. Multiple Controllers allows for multiple computers operating on the same network of Dolby® Lake® Processors, Lake Contour™, and Lake Mesa Quad EQ™ hardware processors.

14.1 Network

Tap **Network** to display the network adapters used to connect the Dolby Lake Controller to the network. This feature can be used to switch between network adapters or to work offline.

1. From **Home**, tap **Network**.
2. Tap the required network connection on the scroll bar.
3. Tap **Select Network,** and then tap **Yes** to the warning message.



If there are multiple adapters available to the Controller, any adapters that are not the currently selected adapter may be disabled to avoid communication errors.

- To disable an adapter, tap the desired network adapter in the scroll bar and then tap **Disable Network**.
- To reenable an adapter, tap on the desired network adapter and then tap **Enable Network**.
- To update information about an adapter, tap the desired network adapter and then tap **Refresh Network**.
- To enable multiple Controllers to be connected to the same network, tap the desired network adapter and then tap **Multiple Controllers**. The **Multiple Controllers** menu buttons display. See Section 14.2 for details on each **Multiple Controllers** menu button.

Note: The Dolby Lake Controller disables unused network adapters whenever communication errors occur. Any adapters that have been disabled automatically will be enabled when the Controller has exited, or when it is minimized.

14.2 Multiple Controllers

14.2.1 Overview and Menu Options

The Dolby Lake Controller system allows multiple Controllers to be connected to the same network. When in this mode, certain functionality is restricted.

The first Controller to connect to a network is called the primary Controller. Any subsequent Controllers are referred to as secondary.

The options shown in Table 14-1 are available on the **Multiple Controllers** submenu.

Table 14-1 Multiple Controllers Options

Button	Function
Multi Cont Enable	This button is available only on the primary Controller and is disabled (gray) on any secondary Controllers. When this button is active (orange), multiple Controllers are allowed on the same network. When the button is inactive (blue), only one Controller is allowed on the network.
Confirmation Required	This button is available only on the primary Controller and is disabled (gray) on any secondary Controllers. When this button is active (orange), a confirmation dialog box is displayed on the primary Controller when a secondary Controller attempts to connect. If this button is inactive (blue), then additional Controllers are able to connect to the network without primary Controller approval.
Analyzer Enable	This button provides the option to disable analyzer data on a per-controller basis (useful when using multiple controllers). If this button is active (orange), analyzer data will be displayed on this Controller. If this button is inactive (blue), analyzer data will not be displayed. This button is disabled (gray) if the analyzer or Analyzer Bridge is not available.

14.2.2 Primary and Secondary Controllers

The primary Dolby Lake Controller communicates with the network of processors, and also with secondary Controllers. The secondary Controllers communicate only via the primary Controller.

The primary Controller can be used in either Designer or User Mode (in which many Designer Mode functions will be restricted). Secondary Controllers are always restricted to User Mode operation.

The primary Controller must have a connection to the network for secondary Controllers to function.

If communication is lost between the primary Controller and the network, all secondary Controllers are suspended with a warning message displayed until the network connection returns.

If the primary Controller is restarted, all secondary Controllers must also be restarted.

If the Controllers become out of sync with the network, the primary Controller must be used to synchronize the network.

In a multiple-Controller environment, it is recommended that the primary Controller is either wired to the network or kept within range of the wireless transmitter to ensure that all Controllers can function without interruption.

Note: When using multiple Controllers, each Controller must have a unique IP address.

14.2.3 Restricted Functionality

Various system functions are restricted when Multiple Controllers mode is active. The following figure shows the functions available on the **Home** menu while in Multiple Controllers mode. The menu buttons shown in gray are unavailable.

Note the **Primary** label on the far right of the help text, above the **Undo** button. This identifies the Controller status, and will read **Secondary** for all secondary Controllers.

System Recall and System Presets are disabled on the **System Store/Recall** menu. Both the primary and secondary Controllers can store system files while in Multiple Controllers mode.

Certain functions on the EQ/Levels/Crossover screens are also restricted when using Multiple Controllers mode. Any unavailable function is identified by a gray button.

To restore full functionality, the primary Controller has the ability to disable Multiple Controllers mode using the **Multi Cont Enable** button. Disabling Multiple Controllers mode disconnects all secondary Controllers. The primary Controller can reenable Multiple Controllers mode in the same session and the secondary Controllers will automatically reconnect.

Note: If Multiple Controllers mode is disabled and then restored by the primary Controller, the system configuration will be completely refreshed on all secondary Controllers to ensure data is synchronized.

14.2.4 Using the Analyzer Bridge with Multiple Dolby Lake Controllers

If an approved analyzer and the Analyzer Bridge are available on the network, Analyzer data will be transmitted and displayed on all Controllers that have the **Analyzer Enable** button activated.

Each Controller has the ability to disable the analyzer independently. One Controller can view analyzer data while other Controllers continue working without the analyzer data being displayed.

To enable/disable analyzer data on a Controller, perform the following steps:

1. From **Home**, tap **Network**, then **Multiple Controllers**.
2. Toggle the **Analyzer Enable** button (orange equals enabled; blue equals disabled).

14.3 Working Offline

Working offline enables the Dolby Lake Controller to be used even if a network is not enabled or present. This allows offline setup of system configurations.

Therefore, systems can be created or modified when a network of Dolby Lake Processors are not available. To work offline, start the Controller without a network adapter enabled, or select **Offline** during initial network selection on startup, or tap the **Network** button in the **Network** button bar and select the network card graphic labeled **Offline** from the scroll bar.

A large majority of functions can be used when offline, although some hardware-specific configuration functions are not accessible.

Note: If an existing system configuration has been modified and stored while offline, the new values will take effect when the system configuration is recalled with an online network or processors.

14.3.1 Virtual Frames

Virtual frames can be used while working offline. A virtual frame provides the same functions as online modules; they can be loaded with module files, copied and pasted, and stored as module files or as part of a system configuration.

The module scroll bar always contains the following virtual frame configurations that represent the available processor range.

To use virtual frames, perform the following steps:

1. Tap the virtual frame icon that you require. The cursor will represent the relevant number of module icons.
2. Place the virtual frame in the work area. The majority of functions are available, enabling full offline configuration.

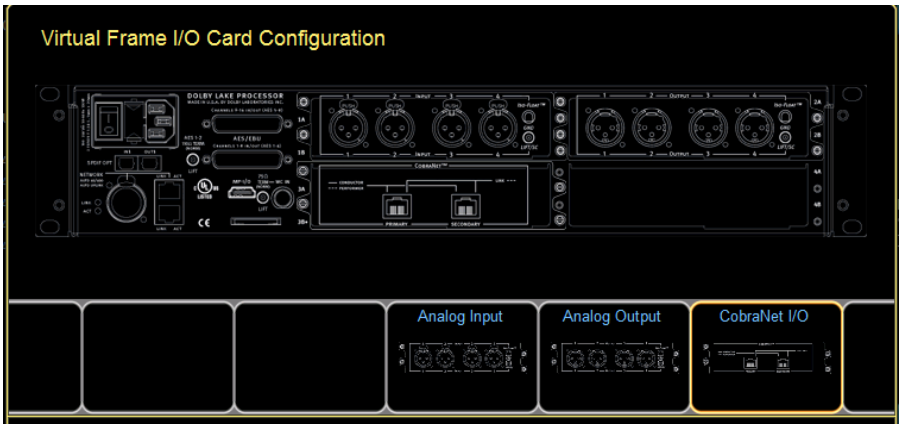
Virtual frames do not have an associated hardware processor identifier, and therefore a replace function is used to assign the module to a real hardware Processor.

See Section 3.3 for details about Contour and Mesa modules.

14.3.2 Virtual Frames I/O Card Configuration

This function enables the user to create a virtual Dolby Lake Processor that has the desired input and output cards. Users can create a virtual system with all input and output assignments, and then use real Dolby Lake Processors (that have the same I/O settings) for the show.

The following screen contains two sections. The upper section displays a diagram of the input/output card configuration on a Dolby Lake Processor. The lower section consists of a scrolling bar that contains analog input, analog output, and CobraNet® input/output cards. You can drag an input/output card to the Dolby Lake Processor.



14.3.3 Replacing Virtual Frames with an Online Processor

The Module Store/Recall or Copy/Paste/Replace functions can be used to transfer the data from a virtual frame to an online frame.

Individual modules created offline can be stored as module files and recalled into an online Processor.

Offline system configurations can be stored and recalled, and then each frame can be replaced with an online Processor.

Please refer to Section 7.4.3 for detailed information on the **Replace Frame** functionality.

Communication and Synchronization

The Dolby® Lake® Controller and hardware processors communicate via an Ethernet network. All updates made using the Controller are transmitted in real time to the network of Dolby Lake Processors. Both the Controller and Processors store all required information, which results in two copies of the data for each module:

- A copy stored in the Controller software
- A copy stored in the Processor hardware

This data redundancy ensures an extremely high level of confidence in communicating over an Ethernet network that can be subjected to other network traffic, as well as interference or lost data packets due to a noisy transport such as wireless Ethernet configurations.

If there is ever a discrepancy found between these two data records, the Controller immediately notifies the user that the two data records are out of sync, and provides a choice to continue using the settings on the hardware processor or to use the settings in the Controller software. Discrepancies are typically caused by making adjustments to a hardware processor via the front-panel interface while the Controller is disconnected temporarily.

This chapter provides useful terminology definitions and reference information for dealing with communication and synchronization issues.

15.1 Offline Modules

A module that cannot be found on the network is referred to as offline. This can occur for the following reasons:

- The processor is turned off.
- The processor is not connected to the network.
- The wireless transmitter is out of range or turned off.
- Faulty network cabling or hardware.

Virtual frames always show offline because they have not been assigned to a hardware Processor, and therefore exist only in the computer's data record.

15.2 Communication/Network Errors

The Dolby Lake Controller displays communication or network problems highlighted in red at the bottom right of the screen:

Communication Error **Network Error** **All Offline**

If a problem persists, the affected modules become offline as described previously. To rectify the situation, check all network connections. If using a wireless access point, make sure the computer is within range.

15.3 Synchronization

This section describes the various synchronization processes between the Dolby Lake Controller software and the Dolby Lake Processors.

15.3.1 Resync Process

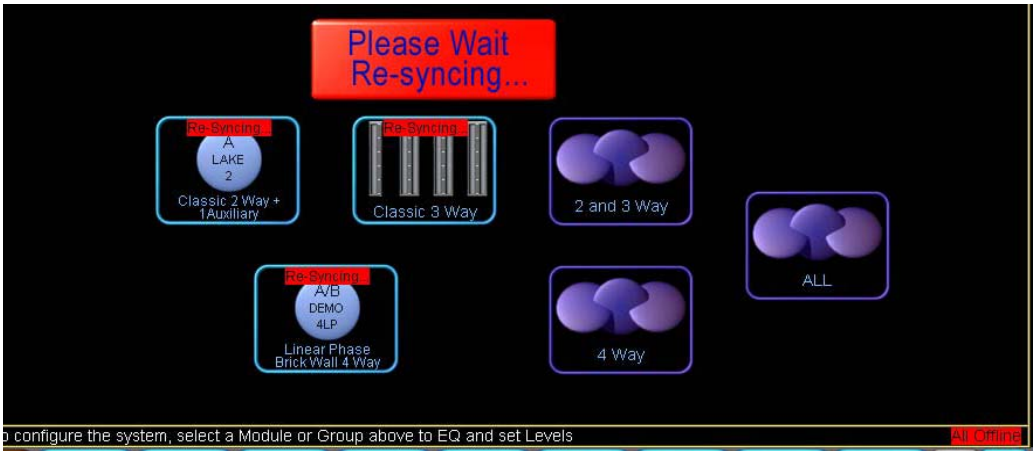
The Resync process ensures that the Dolby Lake Controller software and Dolby Lake Processors are synchronized, or that the operator is informed of differences between the two copies of data.

The Resync process compares the data in the Controller software with that stored in the Processors. If differences are found, the Controller software informs the user that modules are out of sync.

A resync occurs when:

- A system configuration file is recalled
- An offline module becomes online
- A network or communication error occurs

The Controller advises that synchronization is occurring by displaying the message in the following screenshot.



15.3.2 Out of Sync

The Dolby Lake Controller and Dolby Lake Processors could become out of sync for the following reasons:

- An update was made using the Controller software while a unit was offline.
- A communication or network error occurred during an update.

When the affected modules return online, the Controller compares its data with the Processor's data. If differences are found, the Controller highlights which modules are out of sync.

Note: Any affected modules or related groups are set to View Only. No further changes can be made until the computer and processors are synchronized. Audio will not be affected unless the **Use Computer Settings** option is selected.

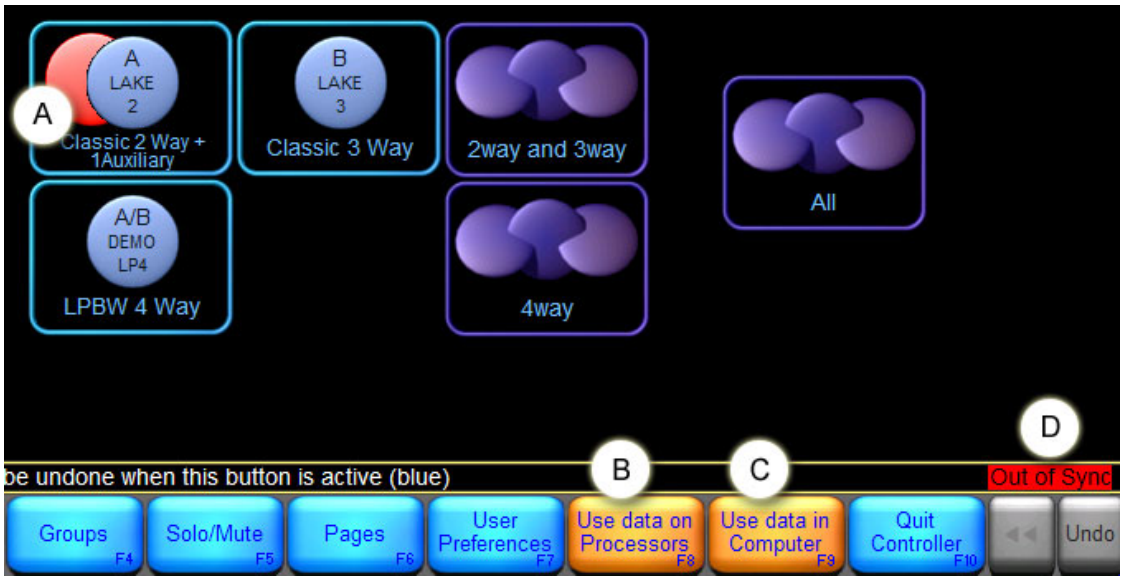


Figure 15-1 Out of Sync Notifications

Table 15-1 defines the notifications labeled in Figure 15-1.

Table 15-1 Out of Sync Notifications

Callout	Explanation
A	A red disc behind the module icon indicates that the module is out of sync.
B	Flashing **Use data on Processors** button.
C	Flashing **Use data in Computer** button.
D	A warning message appears that is visible from any screen in the system.

15.3.3 Updating All Processors with Computer Settings

To update all Dolby Lake Processors with the information stored in the computer, perform the following steps:

1. From the **Home** menu, tap the flashing **Use data in Computer** button.
2. Tap **Yes** on the warning message to confirm the action.

Note: This option may result in an audible effect, as the data in the Processors will be overwritten with the data stored in the computer.

15.3.4 Updating the Controller with Processor Settings

To update the Dolby Lake Controller with the information stored in the Dolby Lake Processors, perform the following steps:

1. From the **Home** menu, tap the flashing **Use data** on Processors button.
2. Tap **Yes** on the warning message to confirm the action.

Note: Audio will not change if this option is selected.

15.3.5 Synchronizing the Dolby Lake Controller and Processors

In the following example, the module became out of sync due to a power interruption on the processor while the PEQ1 overlay was being updated using the Controller. Figure 15-2 shows an example of the **Controller Settings** view, along with letters marking important information.

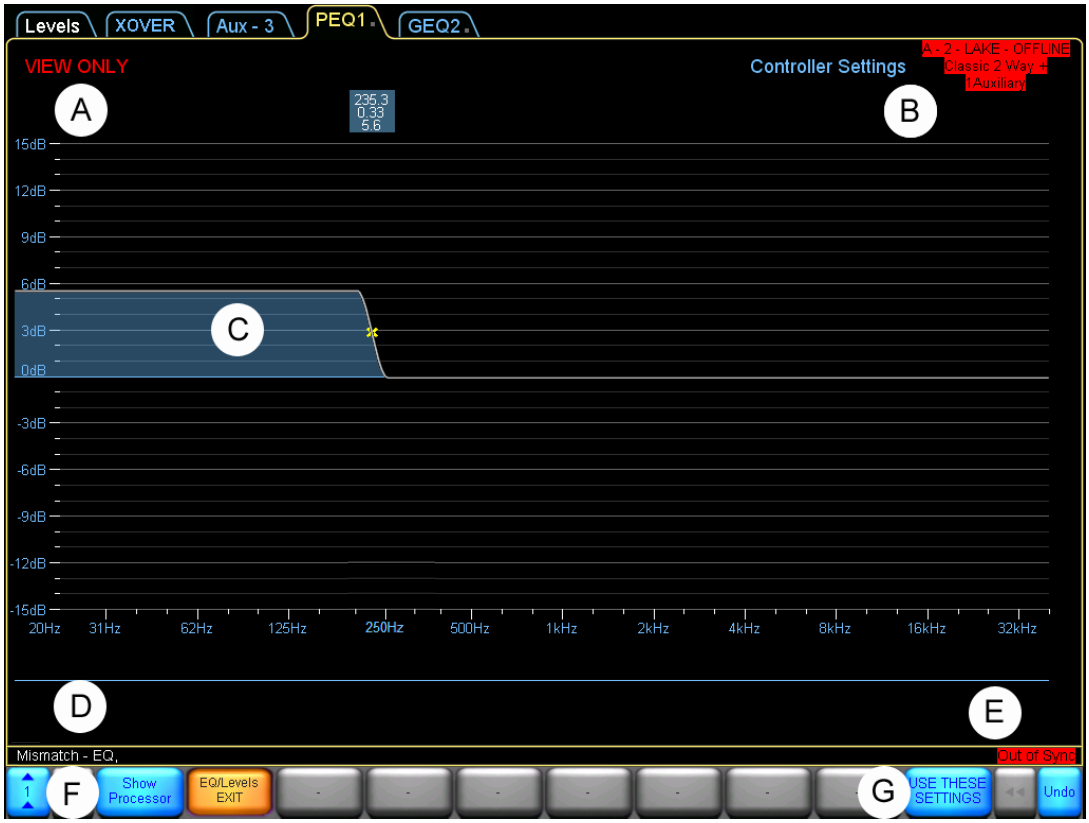


Figure 15-2 Controller Settings on a PEQ1 Screen

Table 15-2 defines the functions labeled in Figure 15-2..

Table 15-2 Controller Settings

Callout	Explanation
A	An out-of-sync module is set to View Only. No changes can be made until the module is synchronized.
B	The settings currently viewed are identified here: Computer—Frame/module name highlighted in red as offline Processor—Frame/module name displayed in blue text as online
C	The main part of the screen changes to show the computer and processor settings as selected.
D	The help text shown here indicates the type of data that is out of sync. Navigate to the relevant section of the system to view/update.
E	The Out of Sync warning message is visible on all screens.
F	This button changes labels depending on the currently selected view. **Show Processor**—When viewing the computer settings **Show Computer**—When viewing the processor settings
G	Tapping this button updates either the computer or processor with the settings currently being viewed.

To compare and update settings stored in the Dolby Lake Controller software and Dolby Lake Processors on the network, perform the following steps:

1. From the Home menu, tap a module icon that is out of sync. An out-of-sync module is indicated by a red disc behind the normal module icon.
2. View the help text (D) that advises which parameters are affected.
3. Navigate to the relevant EQ/Levels page. Computer settings are displayed by default.
4. Tap Show Processor/Show Computer (F) to compare settings.
5. Decide which settings to use, and tap Use These Settings.
6. Repeat the process for each out-of-sync module.

Alternately, all modules can be updated with the Use Data in Computer or Use Data on Processor functions.

15.3.6 Audible Changes when Synchronizing

If a module becomes out of sync while audio is being processed, choosing to synchronize with the Controller could affect the sound (depending on the values that are out of sync).

If the Controller EQ/Crossover/Levels settings differ from those currently used by the Processor, the audio signal may change or be momentarily muted while settings are configured if **Use Data in Computer** is selected.

Keyboard Shortcuts Reference

16.1 Enabling/Disabling Keyboard Shortcuts

Keyboard shortcuts are enabled by default. To disable keyboard shortcuts, perform the following steps:

1. From Home, tap **User Preferences**.
2. Tap **Keyboard Shortcuts** or **F5.**

All keyboard shortcuts will be disabled, and the Function key labels will be removed from the buttons on the button bar. Tap the **Keyboard Shortcuts** button again to enable this feature.

16.2 General Keyboard Shortcuts

The keyboard and mouse-wheel shortcuts in Table 16-1 apply throughout the system.

Table 16-1 Keyboard and Mouse-Wheel Shortcuts

Shortcut	System Areas	Equivalent Touch-Screen Operation
Esc	Warnings, error messages, dialog boxes, and onscreen keyboard	Tapping **No** or **Cancel**
Esc	Submenus	Tapping **Exit** (exiting up one menu level)
Enter	Warnings, error messages, dialog boxes, and onscreen keyboard	Tapping **Yes** or **OK**
Mouse Wheel	Filter point (Xover, PEQ, or GEQ screens)	Dragging the filter point up or down (filter gain cut or boost)

16.3 Button-Bar Shortcuts

16.3.1 Context Switching

To change a context view using the keyboard, perform the following steps:

1. Hold down the **C** key.
2. Tap the number on the keyboard that corresponds to the required context.
3. Release the **C** key.

16.3.2 Main Navigation/Function Buttons

The <F1> through <F10> keys are mapped sequentially from left to right to the main navigation and function buttons on the button bar. Pressing an <F> key will have the same effect as tapping the associated button with a touch-screen pen or pointer. This applies to all button-bar buttons throughout the system.

16.3.3 Undo/Redo

To undo/redo the last Levels or EQ change, perform the following steps:

1. Hold down the **Ctrl** key.
2. Tap the **Z** key.

This function toggles between undo and redo, providing the same affect as tapping the **Undo/Redo** button.

16.4 Shortcut Combination Keys

Throughout the following sections, specific actions are described. These are based on the generic rules for certain keys as shown in Table 16-2.

Table 16-2 Standard Keyboard Shortcuts

Key	Description
Tab	Moves forward (to the right) through pages (Main work area), screens, or EQ overlay tabs.
Shift	Used with Tab, reverses the order or page/screen navigation. Used with the arrow keys, switches between Fine and Normal Adjustment modes (Levels/EQ/Xover/Aux)
Caps Lock	Permanently selects Fine or Normal Adjustment mode (Levels/EQ/Xover/Aux). Does not work in conjunction with Tab.
Ctrl	Allows a key to perform another related function.

16.5 EQ, Levels, Xover, and Aux Screens—General

For the purposes of keyboard shortcut navigation, the Tab functions will cycle through all Levels screens, if a Levels screen is selected, or through all Xover/Aux/EQ screens if any Xover/Aux/EQ screen is selected.

Table 16-3 Tab Shortcuts

Keys	Description
Tab + Ctrl	Cycles forward through the visible screens for either Levels or Xover/Aux/EQ, depending on what is currently selected.
Tab	Moves forward (to the right) through visible screens/overlays. When the last screen/overlay is reached, it will cycle back to the first screen/overlay.
Tab + Shift	Moves backward (to the left) through visible screens/overlays. On the screen overlay, it will cycle to the last screen/overlay.

16.5.1 GEQ Overlay Shortcuts

Table 16-4 GEQ Overlay Shortcuts

Keys	Description
Left Arrow	Moves the GEQ selector one filter to the left
Right Arrow	Moves the GEQ selector one filter to the right
Up Arrow	Increases the gain of the selected GEQ filter (Fine Adjustment mode).
Up Arrow + Shift or Caps Lock	Increases the gain of the selected GEQ filter.
Down Arrow	Decreases the gain of the selected GEQ filter (Fine Adjustment mode).
Down Arrow + Shift or Caps Lock	Decreases the gain of the selected GEQ filter.

16.5.2 PEQ Overlay Shortcuts

Table 16-5 PEQ Overlay Shortcuts

Keys	Description
1	Adds a low-shelf filter at 125 Hz.
2	Adds a parametric filter at 500 Hz.
3	Adds a Mesa filter with low frequency at 830 Hz and high frequency at 1.2 kHz.
4	Adds a high-shelf filter at 8 kHz.
G	The gain value for the selected filter is displayed in the onscreen keyboard for instant editing.
F	The frequency value of the selected filter is displayed in the onscreen keyboard for instant editing.
F + Ctrl	The high-frequency value of a selected Mesa filter is displayed in the onscreen keyboard for instant editing.
B	The bandwidth value of the selected filter is displayed in the onscreen keyboard for instant editing.
B + Ctrl	The high-bandwidth of the selected Mesa filter is displayed in the onscreen keyboard for instant editing.
<	Moves the center frequency of the selected filter to the left.
< + Shift or Caps Lock	Moves the center frequency of the selected filter to the left (Fine Adjustment mode).
>	Moves the center frequency of the selected filter to the right.
> + Shift or Caps Lock	Moves the center frequency of the selected filter to the right (Fine Adjustment mode).
Left Arrow	Selects the filter to the left of the currently selected filter.
Right Arrow	Selects the filter to the right of the currently selected filter.
Up Arrow	Increases the gain of the selected PEQ filter (Fine Adjustment mode).
Up Arrow + Shift or Caps Lock	Decreases the gain of the selected PEQ filter
Down Arrow	Decreases the gain of the selected PEQ filter (Fine Adjustment mode).
Down Arrow + Shift or Caps Lock	Decreases the gain of the selected PEQ filter.
Q	Increases the bandwidth of the selected filter (lowest frequency segment of a Mesa filter).
W	Decreases the bandwidth of the selected filter (lowest frequency segment of a Mesa filter).
A	Increases the high bandwidth of a selected Mesa filter.
S	Decreases the high bandwidth of a selected Mesa filter.
Q	Moves the low-frequency segment of a Mesa filter to the left.
W	Moves the low-frequency segment of a Mesa filter to the right.
A	Moves the high-frequency segment of a Mesa filter to the left.
S	Moves the high-frequency segment of a Mesa filter to the right.

16.5.3 Xover/Aux Screen Shortcuts

Table 16-6 Xover/Aux Shortcuts

Keys	Description
1	Adds a low-shelf filter to the selected output at 125 Hz.
2	Adds a parametric filter to the selected output at 500 Hz.
3	Adds an all-pass filter to the selected output at 1 kHz. (Available in Designer Mode only.)
4	Adds a high-shelf filter to the selected output at 8 kHz.
G	The gain value for the selected filter is displayed in the onscreen keyboard for instant editing. (Not applicable to HPF/LPF filters.)
F	The frequency value of the selected filter (EQ, HPF, or LPF) is displayed in the onscreen keyboard for instant editing.
B	The bandwidth value of the selected filter is displayed in the onscreen keyboard for instant editing. (Not applicable to HPF/LPF filters.)
O	The order of a selected all-pass filter is displayed in the onscreen keyboard for instant editing. (Not applicable to any other filter type and available only in Designer Mode.)
<	Moves the center frequency of the selected filter to the left.
< + Shift or Caps Lock	Moves the center frequency of the selected filter to the left (Fine Adjustment mode).
>	Moves the center frequency of the selected filter to the right.
> + Shift or Caps Lock	Moves the center frequency of the selected filter to the right (Fine Adjustment mode).
Left Arrow	Selects the filter to the left of the currently selected filter.
Right Arrow	Selects the filter to the right of the currently selected filter.
Up Arrow	Increases the gain of the selected EQ filter (Fine Adjustment mode).
Up Arrow + Shift or Caps Lock	Increases the gain of the selected EQ filter.
Down Arrow	Decreases the gain of the selected EQ filter (Fine Adjustment mode).
Down Arrow + Shift or Caps Lock	Decreases the gain of the selected EQ filter.
Q	Increases the bandwidth of the selected EQ filter.
W	Decreases the bandwidth of the selected EQ filter.

16.5.4 Levels Screen Shortcuts

Table 16-7 Levels Shortcuts

Keys	Description
0 (zero) + Enter	Displays onscreen keyboard for instant input-level editing of the currently selected level type.
1 + Enter	Displays onscreen keyboard for instant Output 1–level editing of the currently selected level type.
2 + Enter	Displays onscreen keyboard for instant Output 2–level editing of the currently selected level type.
3 + Enter	Displays onscreen keyboard for instant Output 3–level editing of the currently selected level type.
4 + Enter	Displays onscreen keyboard for instant Output 4–level editing of the currently selected level type.
5 + Enter	Displays onscreen keyboard for instant Output 5–level editing of the currently selected level type.
6 + Enter	Displays onscreen keyboard for instant Output 6–level editing of the currently selected level type.
0 (zero) + Up or Down Arrow	Increases (up) or decreases (down) the input level of the selected level type. (Fine Adjustment mode)
1 + Up or Down Arrow	Increases (up) or decreases (down) the Output 1 level of the selected level type. (Fine Adjustment mode)
2 + Up or Down Arrow	Increases (up) or decreases (down) the Output 2 level of the selected level type. (Fine Adjustment mode)
3 + Up or Down Arrow	Increases (up) or decreases (down) the Output 3 level of the selected level type. (Fine Adjustment mode)
4 + Up or Down Arrow	Increases (up) or decreases (down) the Output 4 level of the selected level type. (Fine Adjustment mode)
5 + Up or Down Arrow	Increases (up) or decreases (down) the Output 5 level of the selected level type. (Fine Adjustment mode)
6 + Up or Down Arrow	Increases (up) or decreases (down) the Output 6 level of the selected level type. (Fine Adjustment mode)
0 to 6 + Up or Down Arrow with Shift or Caps Lock	Coarse adjustment mode for the levels of the number/arrow combinations listed above.

External Control Interfaces

17.1 AMX and Crestron Control

Functionality is currently available for the following functions via AMX® and Crestron® control:

- Frame Preset Recall
- Gain Change
- Input Mute/Unmute
- Output Mute/Unmute
- Retrieve/Set Frame Name

These functions are available using AMX and Crestron Ethernet-based control systems. These external control systems must form valid Ethernet packets that follow the requirements of the network packet specification. Please email livesoundsupport@dolby.com to obtain the information required for integration.

17.2 MIDI Control

17.2.1 Overview

An external hardware device or software program may be configured to transmit MIDI System Exclusive messages (SysEx) to the Dolby® Lake® Controller software, which will trigger the requested change to the Dolby Lake Processors on the network.

To enable this functionality, the PC running the Controller must provide a MIDI input and associated MIDI software drivers—commonly via the PC soundcard or a dedicated MIDI input/output device.

17.2.2 Available Functionality via MIDI

The following functions are available via MIDI SysEx messages:

- Frame Preset Recall (00)
- Group Overlay Bypass/Insert (01)

- Module Overlay Bypass/Insert (02)
- Group Input Mute/Unmute (03)
- Module Input Mute/Unmute (04)
- Group Input Delay (to)

These functions are explained in detail in the following sections.

17.2.3 Hex Conversion for SysEx Messages

SysEx messages are structured using a string of two-character hex codes. These tables show the common numbers and alpha characters that can be used for the purposes of Dolby Lake Controller MIDI messaging.

Numeric Value to Hex Code Conversion

Numeric values are used to identify specific data within the message as described later in this chapter. These numeric values must be entered as hex in the SysEx message. For example, the hex code of 0C (zero, C) identifies Group 12 for the group muting function.

Table 17-1 Decimal and Hexadecimal Equivalents

No.	Hex	No.	Hex	No.	Hex	No.	Hex	No.	Hex	No.	Hex
1	01	10	0A	19	13	28	1C	37	25	46	2E
2	02	11	0B	20	14	29	1D	38	26	47	2F
3	03	12	0C	21	15	30	1E	39	27	48	31
4	04	13	0D	22	16	31	1F	40	28	49	32
5	05	14	0E	23	17	32	20	41	29	50	33
6	06	15	0F	24	18	33	21	42	2A	51	34
7	07	16	10	25	19	34	22	43	2B	52	35
8	08	17	11	26	1A	35	23	44	2C	53	36
9	09	18	12	27	1B	36	24	45	2D	54	37

Alphabet Character to Hex Code Conversion

Alphabet characters are used to identify which Dolby Lake Processor to update for some MIDI commands. Use upper case letters for the frame name, and each frame on the network must have a unique name.

Table 17-2 Alphabet Letter and Hexadecimal Equivalents

Character	Hex	Character	Hex	Character	Hex
- (dash)	2D	I	49	R	52
A	41	J	4A	S	53

Character	Hex	Character	Hex	Character	Hex
B	42	K	4B	T	54
C	43	L	4C	U	55
D	44	M	4D	V	56
E	45	N	4E	W	57
F	46	O	4F	X	58
G	47	P	50	Y	59
H	48	Q	51	Z	5A

For other numbers and characters, please refer to standard ASCII/hex mapping tables.

17.2.4 Frame Preset Recall via MIDI (00)

Table 17-3 shows the SysEx message structure for Frame Preset Recall.

Table 17-3 SysEx Message Structure for Frame Preset Recall

Byte	1	2	3	4	5	6	7	8	9	10	11
Example SysEx Message	F0	00	20	5A	00	2D	2D	2D	2D	01	F7

Table 17-4 describes the contents of the message fields.

Table 17-4 Message Fields for Frame Preset Recall

Byte	Description	Notes
1	Start SysEx Message Identifier	Always **F0**
2	Manufacturer ID—Byte One	**00 20 5A** for all Lake MIDI messaging
3	Manufacturer ID—Byte Two	
4	Manufacturer ID—Byte Three	
5	Identifies the message type	**00** = Frame Preset Recall
6	First character of Frame Name	The Frame Name must be unique on the network. Use capital alphanumeric values. The hex code 2D in the example above represents the character **-**, which is the default Frame Name.
7	Second character of Frame Name	
8	Third character of Frame Name	
9	Fourth character of Frame Name	
10	Frame Preset number to be recalled	**01** → **06** respectively
11	Finish SysEx Message	Always **F7**

17.2.5 Insert/Bypass Group EQ Overlay through MIDI (01)

Table 17-5 shows the SysEx message structure for Insert/Bypass Group EQ Overlay (MIDI 01).

Table 17-5 SysEx Message Structure for Insert/Bypass Group EQ Overlay (MIDI 01)

Byte	1	2	3	4	5	6	7	8	9
Example SysEx Message	F0	00	20	5A	01	04	01	01	F7

Table 17-6 describes the contents of the message fields.

Table 17-6 Message Fields for Insert/Bypass Group EQ Overlay (MIDI 01)

Byte	Description	Notes
1	Start SysEx Message Identifier	Always **F0**
2	Manufacturer ID—Byte One	**00 20 5A** for all Lake MIDI messaging
3	Manufacturer ID—Byte Two	
4	Manufacturer ID—Byte Three	
5	Identifies the message type	**01** = Insert/Bypass Group EQ Overlay
6	Identifies the group number	Group 1 [**01**] through to Group 28 [**1C**]
7	Number of the overlay to insert/bypass	PEQ1 = **01**, PEQ2 = **02**, and so on (01 → 04)
8	Signifies whether to insert or bypass	Bypass = **00**; Insert = **01**
9	Finish SysEx Message	Always **F7**

17.2.6 Insert/Bypass Module EQ Overlay through MIDI (02)

Table 17-7 shows the SysEx message structure for Insert/Bypass Group EQ Overlay (MIDI 02).

Table 17-7 SysEx Message Structure for Insert/Bypass Group EQ Overlay (MIDI 02)

Byte	1	2	3	4	5	6	7	8	9	10	11	12	13
Example SysEx Message	F0	00	20	5A	02	2D	2D	2D	2D	01	01	00	F7

Table 17-8 describes the contents of the message fields.

Table 17-8 Message Fields for Insert/Bypass Group EQ Overlay (MIDI 02)

Byte	Description	Notes
1	Start SysEx Message Identifier	Always **F0**
2	Manufacturer ID—Byte One	**00 20 5A** for all Lake MIDI messaging
3	Manufacturer ID—Byte Two	
4	Manufacturer ID—Byte Three	
5	Identifies the message type	**02** = Insert/Bypass Module EQ Overlay
6	First character of Frame Name	The Frame Name must be unique on the network.

Byte	Description	Notes
7	Second character of Frame Name	Use capital alphanumeric values. The hex code 2D in the example above represents the character -, which is the default Frame Name.
8	Third character of Frame Name	
9	Fourth character of Frame Name	
10	Module Reference	Module A = **01** Module B = **02** Module C = **03** (Mesa only) Module D = **04** (Mesa only)
11	Number of the overlay to insert/bypass	PEQ1 = **01**, GEQ2 = **02**, and so on (01 → 08)
12	Signifies whether to insert or bypass	Bypass = **00**; Insert = **01**
13	Finish SysEx Message	Always **F7**

17.2.7 Mute/Unmute Group Input through MIDI (03)

Table 17-9 shows the SysEx the message structure for Mute/Unmute Group Input (MIDI 03).

Table 17-9 SysEx Message Structure for Mute/Unmute Group Input (MIDI 03)

Byte	1	2	3	4	5	6	7	8
Example SysEx Message	F0	00	20	5A	03	01	01	F7

Table 17-10 describes the contents of the message fields.

Table 17-10 Message Fields for Mute/Unmute Group Input (MIDI 03)

Byte	Description	Notes
1	Start SysEx Message Identifier	Always **F0**
2	Manufacturer ID—Byte One	**00 20 5A** for all Lake MIDI messaging
3	Manufacturer ID—Byte Two	
4	Manufacturer ID—Byte Three	
5	Identifies the message type	**03** = Mute/Unmute Group Input
6	Identifies the group number	Group 1 [**01**] through to Group 28 [**1C**]
7	Signifies whether to mute or unmute	Unmute = **00**; Mute = **01**
8	Finish SysEx Message	Always **F7**

17.2.8 Mute/Unmute Module Input through MIDI (04)

Table 17-11 shows the SysEx message structure for the message structure for Mute/Unmute Group Input (MIDI 04).

Table 17-11 SysEx Message Structure for Mute/Unmute Group Input (MIDI 04)

Byte	1	2	3	4	5	6	7	8	9	10	11	12
Example SysEx Message	F0	00	20	5A	04	2D	2D	2D	2D	01	01	F7

Table 17-12 describes the contents of the message fields.

Table 17-12 Message Fields for Mute/Unmute Group Input (MIDI 04)

Byte	Description	Notes
1	Start SysEx Message Identifier	Always **F0**.
2	Manufacturer ID—Byte One	**00 20 5A** for all Lake MIDI messaging.
3	Manufacturer ID—Byte Two	
4	Manufacturer ID—Byte Three	
5	Identifies the message type	**04** = Mute/Unmute Module Input.
6	First character of Frame Name	The Frame Name must be unique on the network. Use capital alphanumeric values. The hex code 2D in the example above represents the character **-**, which is the default Frame Name.
7	Second character of Frame Name	
8	Third character of Frame Name	
9	Fourth character of Frame Name	
10	Module Reference	Module A = **01** Module B = **02** Module C = **03** (Mesa only) Module D = **04** (Mesa only).
11	Signifies whether to mute or unmute	Unmute = **00**; Mute = **01**.
12	Finish SysEx Message	Always **F7**.

17.2.9 Change Group Input Delay Through MIDI (05)

Table 17-13 shows the SysEx message structure for changing Group Input Delay (MIDI 05).

Table 17-13 SysEx Message Structure for Group Input Delay (MIDI 05)

Byte	1	2	3	4	5	6	7	8	9	10
Example SysEx Message	F0	00	20	5A	05	01	11	2B	4B	F7

Table 17-14 describes the contents of the message fields.

Table 17-14 Message Fields for Group Input Delay (MIDI 05)

Byte	Description	Notes
1	Start SysEx Message Identifier	Always **F0**
2	Manufacturer ID—Byte One	**00 20 5A** for all Lake MIDI messaging
3	Manufacturer ID—Byte Two	
4	Manufacturer ID—Byte Three	
5	Identifies the message type	**05** = Change Group Input Delay
6	Identifies the Group number	Group 1 [**01**] through to Group 28 [**1C**]
7	(1)00 → (20)00 milliseconds of delay	First pair of digits representing hundreds and thousands (for example, 11 = 1,700 ms)
8	(1)>(99) → milliseconds of delay	Second pair of digits representing single units and tens (for example, 2B = 43 ms)
9	0.(01) → 0.(99) milliseconds of delay	Third pair of digits representing numbers after decimal place (for example, 4B = 0.75 ms)
10	Finish SysEx Message	Always **F7**

For example, bytes 7, 8, and 9 form the delay time in milliseconds: *xxyy.zz*, where *xx* is byte 7, *yy* is byte 8, and *zz* is byte 9. In the example above (11:2B:4B), the resulting time in milliseconds is 1,743.75.

Designer Mode Reference

18.1 Designer Mode Basics

The Dolby® Lake® Controller software provides two modes of operation: User Mode and Designer Mode. This chapter describes the Designer Mode.

Some important functions that Designer Mode activates include the following:

- Global Access security
- Individual overlay/screen access security
- Level Limits
- Factory levels (Adjust Factory mode)
- Password protection of modules and base configurations
- All-pass filters
- Designer Worksheets
- Polarity locking

This document provides detailed descriptions of these functions. An example system design illustrates the utility of Designer Mode functions. A quick reference guide provides a high-level overview of Designer Mode functions.

This document refers to loudspeaker modules in the examples, although all features (with the exception of crossovers) also apply to Mesa EQ™ modules.

18.1.1 Security Levels

Designer Mode provides three levels of password-protected security that can be applied to a system configuration.

Global

At the global level, a simple selection makes system-wide changes that affect what can be seen or adjusted in User Mode. A system designer can choose to hide any combination of EQ overlays, Xover/HPF/LPF tabs, levels, and meters. These items can also be set to View Only, allowing a User Mode operator to view but not change certain information.

Note: Global settings are saved in the system configuration file.

Module

Individual EQ overlays and crossover tabs can be hidden or set to View Only. Additional settings normally invisible in User Mode can also be adjusted and hidden at the module level.

At the module level, changes are specific to individual modules and groups. Discrete password protection can be applied to modules, providing an additional level of security.

Base Configuration

Base configuration is the lowest level of module security, enabling the system designer to define an underlying base EQ curve and crossover settings along with factory levels and level limits. A system designer can restrict what can be seen or adjusted and provide optional password protection to the underlying settings.

Note: The Dolby Lake Controller is not shipped with base configuration files. These can be created if required using default module files.

18.1.2 Designer Mode

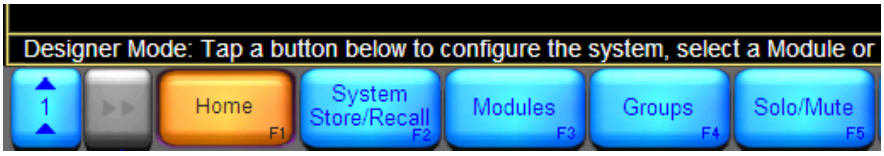
The functions available in Designer Mode can be used with or without password protection. By default, the Designer Mode password is empty, allowing unprotected access to Designer Mode in a new installation of the Dolby Lake Controller software.

To access Designer Mode:

1. From **Home**, tap **User Preferences**.
2. Tap **Designer Functions**.
3. Tap **Designer Mode**.

Additional buttons on the button bar become active, providing functions specific to Designer Mode.

When Designer Mode is active, the text **Designer Mode** appears above the toolbar.



Password Protection of Designer Mode

Each software installation has one Designer Mode password. This password is stored on the host computer and is relevant for any system configuration.

To password protect Designer Mode, perform the following steps:

1. Tap the **Change Password** button.
2. Enter a password, and tap **OK**.
3. Confirm the password, and tap **OK**.

It is important that you record the Designer Mode password in a safe place. Once the password is set, it will always be required to enter Designer Mode.

Note: If the Designer Mode password is forgotten, please contact livesoundsupport@dolby.com for details on password retrieval.

Simple Designer Mode System Security

If multiple levels of security are not required for your Dolby Lake Controller installation, exiting Designer Mode activates all security features described in this document without needing to lock or password protect individual modules or base configuration files.

18.1.3 Designing and Protecting a Dolby Lake Controller System

This section discusses how to use Designer Mode to protect your system by developing an example system with one Dolby Lake Processor. The example includes detailed instructions to define a base configuration, lock individual module level settings, and enforce global security.

Note: You must have properly networked a Processor and the Dolby Lake Controller host computer.

System Setup for Designer Mode Tutorial

Follow the steps below to prepare for the tutorial.

To access Designer Mode, perform the following steps:

1. From **Home**, tap **User Preferences**.
2. Tap **Designer Functions**.
3. Tap the **Designer Mode** button and enter your Designer Mode password if prompted. (If the Designer Mode button is orange, you are already logged in to Designer Mode.)
4. Tap **Home** to return to the **Main** menu.
5. Place the modules of a factory-reset Processor in the work area.

To label the frame and save the system:

1. Tap **Store/Recall Exit**, then tap **Label & Lock**.
2. Tap **Label Frame**, enter Lake as the frame name, and tap **OK**.
3. Tap **Home**, then **System Store/Recall**.
4. Navigate to or create a folder in which to store the file.
5. Tap **New Store**, enter the file name as Designer Mode Tutorial, and tap **OK**.

Your system configuration is now ready for the following tutorials.

18.2 Designer Mode Security

18.2.1 Security for the Base Configuration

A base configuration file contains EQ, levels, crossover, and HPF/LPF information for a particular speaker type. A base configuration file can be used to create a standard starting point for a particular make and model of speaker; this can then be used in a variety of system configurations and fine-tuned using module and group settings.

The base password is saved with the base configuration file and is stored at the hardware level when loaded into a Dolby Lake Processor. This prevents access to certain data stored in the base configuration file, even if you are in Designer Mode in the Dolby Lake Controller software. Using a base password allows hiding of your custom settings from any user of the Controller system.

Note: The base configuration file hides EQ curves, crossovers, or highpass and lowpass filters, and converts group and module levels to hidden Factory values. The use of base configuration files is recommended only for experienced Controller users who require this additional level of security and functionality. Module files provide additional functionality to base configuration files and can be used instead of base configuration files in most circumstances.

Crossover and Output EQ

All information in the **Xover** screen (Lake Contour™) or **HPF/LPF** screen (Mesa EQ) is stored in the base configuration file, including crossover frequencies, crossover type (for example, Bessel, Butterworth, or Linkwitz-Riley), along with any output-specific EQ, HPF/LPF settings, and crossover access status. All data in the **Xover** screen can be adjusted for each module, unless the designer has applied security to the base configuration file.

A base configuration file cannot be loaded into a module running a different DSP program. For example, a two-way base configuration file cannot be loaded into a module that is currently running a three-way module program; a two-way module program must be loaded first.

PEQ and GEQ

All module and group EQ overlays are combined and stored as an invisible default EQ curve for the new base configuration. Once stored in the base configuration files, this default EQ curve cannot be viewed or adjusted, although further EQ overlays can be created at the module or group level. When the new base configuration file is loaded into a different module, the main EQ appears flat. Output-specific EQ from the Xover or output EQ screens can still be viewed or adjusted, unless the system designer has protected it.

Note: The EQ curve created in the PEQ and GEQ overlays is separate from any output-specific EQ created on the Xover page (applicable to loudspeaker modules only).

Levels

With the exception of the MaxRMS Limiter Corner, Attack and Release, the current module and group levels are combined and stored as factory levels when a base configuration file is saved. The factory levels can be viewed and adjusted in Designer Mode after activating the Adjust Factory option in the **Levels/Meter Options** menu.

Level Limits, also stored with a base configuration file, can be viewed and adjusted from **Levels/Meter Options → Levels Limits**.

Base Configuration Tutorial

This tutorial illustrates important features of base configuration files, using loudspeaker modules as the example. For Mesa EQ processors, use the only output available on each module and ignore the steps regarding crossovers.

To adjust levels and Level Limits, perform the following steps:

1. Navigate to the **Gain** levels page of module **A**.
2. Adjust the Output 2 gain to –9 dB.

3. Tap the **Delay** button and increase Output 3 delay to 6 ms.
4. Tap **Meter Options**, then tap **Level Limits**.
5. Select **Gain/Delay Limits**.
6. Tap the Max Delay value highlighted in blue for the input channel. This is located on the left of the screen, second from bottom, and should initially read 1800.00.
7. Enter **0** (zero), and tap **OK**.

Setting a maximum value identical to the minimum value removes the fader when in User Mode, or when the base configuration file or module is locked.

To adjust crossover settings, perform the following steps:

1. Tap the **EQ** tab (top left) and select **Xover** (Lake Contour) or **HPF/LPF** (Mesa EQ).
2. With the first output (low frequency) selected, tap **Crossover Select**.
3. Select **36dB Butterworth** from the scroll bar.
4. Tap **Crossover Set**, then tap **Yes** to the warning message.
5. Tap **HPF Enable** located at the top left of the screen.
6. Tap **Xover Functions** from the button bar, then tap **Crossover View Only.** This hides the crossover screen or HPF/LPF screen when in User Mode, or when the base configuration/module is locked.

To add EQ, perform the following steps:

1. Tap **PEQ1** and add a low-shelf filter around 80 Hz, with 3 dB of gain.
2. Tap **Home**.

To lock the base configuration, perform the following steps:

1. Tap **Modules**, then tap module **A** to select it.
2. Tap **Label & Lock**. The following options are displayed:

3. Tap **Set Base Password**, type Demo, and tap **OK**.
4. Type Demo again to confirm, and tap **OK** to the message.
5. Tap **Base Unlocked**. This changes to read **Unlock Base** and the password is now required to unlock this base configuration file.

The **Xover** page will be displayed as View Only until it is unlocked. Any user, even a system designer, cannot adjust the settings unless they first unlock the base configuration file.

Level Limits and Adjust Factory options are locked out in both User Mode and Designer Mode, and the input delay fader is removed when in User Mode.

To save the new base configuration file, perform the following steps:

1. Tap **Label Exit**, then **Module Store/Recall**.
2. Tap **Base Configuration**.
3. Navigate to the desired folder location or create a new folder.
4. Tap **New Store**, enter Base Config Test, and tap **OK**.

The file is stored in the folder you navigated to prior to storing, and the screen appears similar to the following figure.

In addition to locking the crossover, HPF/LPF, and EQ of a base configuration file, the entire file can be protected from accidental deletion.

To secure the base configuration file, perform the following steps:

1. Tap **File Utilities**.
2. Select the Base Config Test base configuration file from the scroll bar.
3. Tap **Read Only**. Notice that the **Delete** button is now disabled for this file.

Note: For further protection, base configuration file utilities are disabled when in User Mode.

To load the new base configuration file into module **B** of the Processor:

1. Tap **File Util Exit**, then tap the **module B** icon to select it.
2. Select the Base Config Test file on the scroll bar, and tap **Recall**.
3. Tap **Yes** to the warning message.

All data changed during this tutorial is loaded into module **B**, and because the base configuration was locked, some data is now invisible or protected. Navigate to the various sections of module **B** to verify the changes made to the base configuration file.

Issue	Navigate to...
Factory Levels are locked.	**Levels → Meter Options** The Adjust Factory button normally present is not available until the base configuration file is unlocked.
Level Limits are locked.	**Levels → Meter Options** The Level Limits button normally present is not available until the base configuration file is unlocked.
The Input Delay Max Level Limit is set to zero.	**Levels → Delay** Attempt to move the input delay fader. Designer Mode only. (In User Mode, this delay fader is removed.)
Crossover and HPF/LPF settings have been transferred and are set to View Only, or HPF/LPF settings have been have been transferred and are set to View Only.	**EQ → Xover** tab **EQ → HPF/LPF** tab.
The EQ setting has been transferred.	Not applicable. PEQ and GEQ settings saved in base configuration files cannot be viewed, although an audio comparison can be made between module A and B to verify they are identical.

Summary

Base configuration files enable low-level security allowing control over individual aspects of the system. The system designer can fine-tune a speaker configuration or system EQ and protect the settings by hiding or setting them as View Only.

The base configuration files can be saved and loaded into other modules in the same system or in different systems. This provides a starting point from which the module can be fine-tuned by another designer or user.

Note: The module **I/O Config** screen displays the name of the base configuration file that was originally loaded or most recently saved. Module **I/O Config** is located under the **Modules** menu.

18.2.2 Security for Module Functions

All settings that can be protected for a base configuration can also be protected for a module. Base configuration settings are overwritten by module settings, unless access has been restricted in the base configuration file, in which case certain parameters will not be accessible. The base configuration file itself will not be affected by any changes made to a module after the file is loaded.

The module password is saved with the single module file, and is stored at the hardware level when loaded into a Dolby Lake Processor. This prevents access to certain data stored in the module file, even if you are in Designer Mode in the Dolby Lake Controller. Using a Module password allows hiding of your custom settings from any user of the Controller.

The following features are available for both base configuration and module files:

- Adjust and lock factory levels
- Adjust and lock access to crossover settings
- Hide unused channels
- Adjust Level Limits
- Disable individual level faders or entire levels sections from other users (using Level Limits and Module Lock)

In addition to these features, a system designer can also adjust and lock access to individual PEQ and GEQ overlays.

Module Tutorial

The following tutorial illustrates Designer Mode's most important module features. It also includes some functions that relate to both base configuration and module files, such as Level Limits. Use the same Designer Mode tutorial system configuration from earlier in this chapter. Ensure you are in Designer Mode and that the base configuration is unlocked before proceeding.

For Mesa EQ modules, use the only output available on each module and ignore the steps regarding crossovers.

To add PEQ and set the overlay to View Only, perform the following steps:

1. Navigate to the **PEQ1** page of module **A**.
2. Add a high-shelf filter (gain: 10 dB; frequency: 10 kHz; bandwidth: 3).
3. Tap **Overlay Functions**, then **Overlay Properties**.
4. Tap **Overlay View Only** (illuminates orange).

To add GEQ and hide the overlay, perform the following steps:

1. Tap **GEQ2**.
2. Reduce the 125 Hz filter by 6 dB.
3. Tap **Overlay Hide** (illuminates orange).

Note: When an EQ overlay is hidden, the effect its filters have on the overall EQ curve is not visible in User Mode or when the module is locked.

To remove an unused channel meter and fader, perform the following steps (not applicable for Mesa EQ):

1. Tap the **Levels** tab.
2. Tap **Label Channel**.
3. Tap the **Mute/Label** button of output 3.
4. Type unused, and tap **OK**.

To lock the module, perform the following steps:

1. Tap **Home**, then **Modules**.
2. Tap the icon for module **A** to select it.
3. Tap **Label & Lock**, then **Set Mod Password**.
4. Type demo, then tap **OK**.
5. Type demo again to confirm, tap **OK**, then tap **OK** to the message.
6. Tap **Module Unlocked**.

To save the new module file, perform the following steps:

1. Tap **Label Exit**, then **Module Store/Recall**.
2. Navigate to the required folder.
3. Tap **New Store**, type demo module, and tap **OK**.

To load the saved file into module **B**, perform the following steps:

1. Tap the icon for module **B**.
2. Tap the **Demo** module file on the scroll bar.
3. Tap **Recall**, then **Yes** to the warning message.
4. Exit **Designer Mode** to see the effect of the changes on module A. (Module B is already locked following loading the module file.) All updates made previously also remain.

Summary

Modules can store and secure all data that a base configuration can. In addition, the module can restrict access to input EQ overlays.

18.2.3 Security for Group Functions

Groups are used to connect and adjust multiple modules. Groups cannot be locked or password-protected, but individual EQ overlays can be hidden. Global Access settings also apply to groups. Security for levels and crossovers is not relevant for groups.

A group may contain various types of modules, each with different security settings. Group levels, however, are restricted by the level limits set for the modules within the group. For example, if changing a group level causes one or more modules to exceed their minimum/maximum level limits, the action is not permitted.

Group Tutorial

To add a group to the configuration, perform the following steps:

1. From **Home**, tap **Groups**.
2. Tap **Group 1** from the **Groups** scroll bar, and tap again in the work area.
3. Tap **Assign**, then tap the module A and module B icons.
4. Tap **Assign** again to exit the Group Assignment mode.
5. Tap **EQ/Levels** and navigate to the **PEQ1** page of Group 1.

To add PEQ and hide the overlay, perform the following steps:

1. Add a parametric filter (gain: –6 dB; frequency: 125 Hz; bandwidth: 1).
2. Tap **Overlay Functions**, then **Overlay Properties**.
3. Tap **Overlay Hide** (illuminates orange), then tap **Ovlay Prop Exit.**

Note: When an EQ overlay is hidden, the effect its filters have on the overall EQ curve are not visible in User Mode or when the module is locked.

To add GEQ and set the overlay to **View Only**, perform the following steps:

1. Tap **Overlay New**. The overlay Group 1/PEQ2 is created.
2. Tap **Overlay GEQ,** then **Yes** to the warning message.
3. Reduce the 4 kHz filter by 4 dB.
4. Tap **Overlay Properties**, then **Overlay View Only** (illuminates orange).

To verify the effect of the changes, perform the following steps:

1. Tap **Home**, then **User Preferences**.
2. Tap **Designer Mode** to return to User Mode (button becomes blue).
3. Tap **Home**, then tap the **Group 1** icon and navigate to **EQ**.

PEQ1 is hidden, and its filter is not displayed in the EQ curve, although its effect is still audible. GEQ2 is displayed as View Only, and most functions are disabled.

Summary

Because a group may contain various types of modules with different security settings, group security is limited to EQ overlays only. Crossovers are not relevant to groups, and all security for levels is controlled via individual modules.

18.2.4 Security for Global Access Functions

Global Access settings affect all modules and groups within a system configuration. To enable Global Access mode, perform the following steps:

1. From **Home**, tap **User Preferences**.
2. Tap **Designer Functions**. (Ensure Designer Mode is active—orange.)
3. Tap **Global Access**.

The following options are available:

Table 18-1 Global Access Security Functions

Function	Result in Normal User Mode
EQ Hide	Hides all EQ overlays for all modules and groups
EQ View Only	Protects all EQ overlays from adjustment for all modules and groups
Xover Hide	Hides all Xover screens or HPF/LPF screens for all modules and groups
Xover View Only	Protects all Xover screens or HPF/LPF screens from adjustment for all modules and groups
Levels Hide	Hides all Levels screens for all modules and groups
Levels View Only	Protects all Levels screens from adjustment for all modules and groups

Global Access Tutorial

To hide all crossover, HPF/LPF and EQ overlays in a system, perform the following steps:

1. From **Home**, tap **User Preferences**.
2. Tap **Global Access**, then tap **EQ Hide**.
3. Tap **Xover Hide**. Active buttons illuminate orange.
4. To activate these global settings:
   - Tap Glbl Access Exit.
   - Tap Designer Mode. The button becomes blue (inactive/available) in User Mode.

Summary

The Global Access functions apply an overall security to a particular Controller system and can be used in addition to the system security settings.

18.3 Functional Reference Guide

This section provides an overview of the steps required for each Designer Mode process. This can be used as a quick reference for the features described throughout the tutorial based on the procedure or function. This section describes the standard functions using the **Levels**, **Xover**, and **EQ** screens.

Note: Designer Mode must be active to access the functions described in this section.

18.3.1 Xover/Aux/HPF/LPF Functions

These functions apply to base configurations and modules only. The Xover buttons listed below could read **Aux Output** or **HPF/LPF** depending on the module type.

Set Individual Xover/Aux or HPF/LPF Screens to Hide/View Only

1. Navigate to the **Xover** or **Aux Output** screen or to the **HPF/LPF** screen.
2. Tap **Crossover Functions**.
3. Tap **Crossover View Only** or **Crossover Hide**. The selected status is illuminated orange.

Set All Xover/Aux or HPF/LPF Screens to Hide/View Only

This affects all crossover screens in the current system configuration.

1. From **Home**, tap **User Preferences**.
2. Tap **Global Access**.
3. Tap **Crossover Hide** or **Crossover View Only**. The selected status is illuminated orange.

All Pass Filters

In Designer Mode, the All Pass filter is available on the Xover/Aux Output screens. The All Pass filter icon is identified in the following figure:

The All Pass filter allows first- and second-order (default) phase adjustment with variable bandwidth and frequency.

To add an All Pass filter to an output, perform the following steps:

1. Select an output on the **Xover** page, or select the required **Aux Output** screen.
2. Tap the **All Pass** filter icon.
3. Tap on the main part of the screen to add the filter.
4. Adjust the order, frequency, and bandwidth as required.

18.3.2 EQ Functions

Note: These functions apply only to modules and groups.

Set Hide/View Only Status for an Individual EQ Overlay

1. Navigate to the module or group overlay in **EQ/Levels**.
2. Tap **Overlay Functions**, then **Overlay Properties**.
3. Tap **Overlay View Only** or **Overlay Hide.** The selected status is illuminated orange.

Set Hide/View Only Status for All EQ Overlays

This affects all EQ overlays in the current system configuration.

1. From **Home**, tap **User Preferences**.
2. Tap **Global Access**.
3. Tap **EQ Hide/EQ View Only**.

18.3.3 Levels Functions

Adjust Factory

A button labeled **Adjust Factory** is available on the **Meter Options** menu from the Levels page of a module. When this button is active (orange), a label reading **Adjust Factory** appears at the top of each Levels page to confirm this special mode of operation. Factory levels are not applicable for groups.

In this mode, a different set of factory levels are displayed for each level type. These are displayed using the same faders and meters used for the adjustment of user levels; the fader positions and gain values change to indicate the factory level instead of the user level.

Note: The sum of factory, user, and group levels are combined to provide the actual total. Factory levels are not included in the total level value that is shown in brackets in User Mode.

Table 18-1 shows which level types are available in Adjust Factory mode.

Table 18-1 Available Level Types in Adjust Factory Mode

Level Type	Available
Gain	Yes
Delay	Yes
MaxRMS Level	Yes
MaxRMS Corner	No
MaxRMS Attack	No
MaxRMS Release	No
MaxPeak Level	Yes

To set factory levels, perform the following steps:

1. From the Levels page, tap **Meter Options**, then **Adjust Factory**.
2. Tap **Meter Opts Exit**, and navigate to the relevant Levels page.
3. Enter the values required using the fader or keyboard entry.
4. Tap **Meter Options**, then **Adjust Factory** to exit this mode.

Note: Factory levels can be hidden from the end user by locking the module or exiting Designer Mode.

Restrict Level Adjustments

Level Limits are used to restrict minimum and maximum levels for a module. Although a group's Level Limits cannot be set, they adhere to the limits of all modules that are assigned to it. For example, if changing a group level causes any of its modules to exceed their allowable range, the action is not permitted.

1. Navigate to module **Levels**, tap **Meter Options,** then tap **Level Limits**.
2. Tap **Gain/Delay Limits** or **LimiterMax™ Limits**.
3. Tap the relevant minimum/maximum level. Each channel is displayed in the same order as the channel faders (from left to right: Input, Output 1, Output 2, and so on).
4. Enter the limit, and tap **OK**.

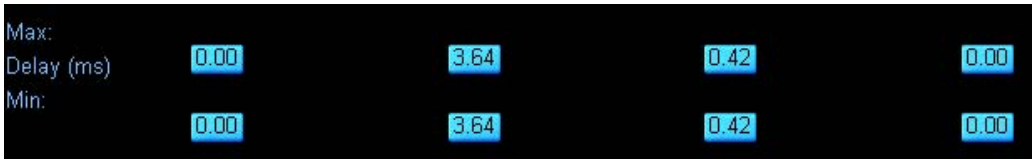
Disable Level Adjustments

If the minimum and maximum level limits are identical for a particular channel and level type, that control is effectively disabled. The fader for the associated channel and level type is not visible in User Mode or when the module is locked.

Set both the minimum and maximum values of a particular level output and level type to the same value. To verify that the fader has been removed and the level fixed, either lock the module or base configuration or switch to User Mode.

Disable Access to a Levels Function

To disable access to an entire level function (delay, for example), set identical minimum and maximum delay level limits for every channel for the module. Set the minimum and maximum values of all inputs/outputs for a particular level type to the same value.



The preceding figure shows an example of identical minimum/maximum settings for delay. These settings disable the Levels function on the **EQ/Levels** menu in User Mode or when the module or base configuration is locked.

Disable/Enable Unused Output Channels

To completely hide a levels meter/fader, set the name of fader to **Unused**, perform the following steps:

1. Navigate to the relevant module **Levels** page.
2. Tap **Label Channel**, then tap the mute/label button of the relevant channel.
3. Type Unused, and tap **OK**.

The meter and fader will be invisible on the software Controller, and the meter is also disabled on the front panel of the Dolby Lake Processor. To enable the channel again, change the channel label to something other than Unused.

Set Hide/View Only Status for All Levels Screens

This function affects all Levels screens in the current system configuration.

1. From **Home**, tap **User Preferences**.
2. Tap **Global Access**, then tap **Levels Hide** or **Levels View Only**. The selected button is illuminated orange.

18.3.4 Additional Designer Mode Functions

Switch between Designer Mode and User Mode

To access Designer Mode, perform the following steps:

1. From **Home**, tap **User Preferences**, then tap **Designer Mode**.
2. Enter the password (if set), and tap **OK**.

To switch to User Mode, perform the following steps:

1. From **Home**, tap **User Preferences**. The Designer Mode button is orange when Designer Mode is active.
2. Tap **Designer Mode**. The Designer Mode button is now blue; Designer Mode is inactive.

Lock and Password-Protect a Module or Base Configuration

Locking a module or base configuration enables access security (such as hiding EQ overlays, setting Xover screens to View Only, and disabling level functions). The Label & Lock function activates security in both User Mode and Designer Mode, allowing certain settings to be protected from other system designers.

From the **Modules** menu, tap a module icon to select it.

1. Tap **Label & Lock**.
2. Tap **Set Mod Password** (for module) or **Set Base Password** (for base module).
3. Enter a password, and tap **OK**.
4. Confirm password, tap **OK**, then tap **OK** to the warning message.
5. Tap **Module Unlocked** or **Base Unlocked** to lock the relevant settings.

Unlock a Locked Module or Base Configuration

From the **Modules** menu, tap a module icon to select it.

1. Tap **Label & Lock**.
2. Tap **Unlock Module** or **Unlock Base**.
3. Enter the associated password, and tap **OK**.

Creating Descriptions/Assigning Graphics for Module Files

Text files (.txt) and bitmap files (.bmp) with the same file name as a module file can be placed in the **data/user/modules** directory of your Controller installation.

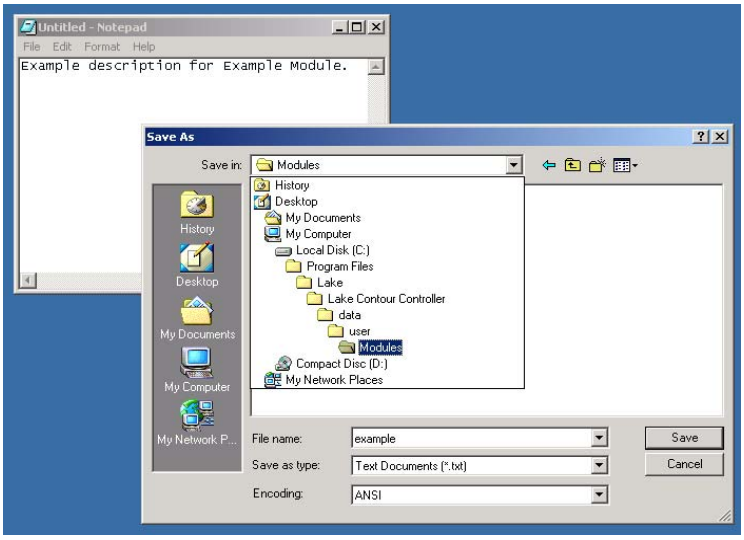
When a text file is present with the same file name, the Controller displays the text when the module file is selected on the Module Store/Recall scroll bar. When a bitmap file is present, the graphic is displayed in place of the default module icon.

Note: If bitmap files are used to replace the standard module graphics, these must be 24-bit Microsoft® Windows® format bitmaps of 80 × 80 pixels maximum dimension. Module name text will overwrite the bottom portion of this 80 × 80 bitmap.

Follow these steps to create and view module file descriptions:

1. Store a module with the file name example at the module root directory.
2. Minimize the Controller and, using a text editor (such as Microsoft Notepad), create a text file containing the text: Example description for Example Module.

3. Store this text file in the directory:
   Program Files/Dolby/Dolby Lake Controller/data/user/modules as example.txt.



4. Maximize the Dolby Lake Controller and navigate to **Module Store/Recall**.
5. Select the module file example from the scroll bar. The text you entered appears above the module as shown here:

Module descriptions can be modified by editing the text file, or removed by deleting the text file. A shortcut to the **data/user** folder is available from:

Start → Programs → Dolby Lake Controller → Dolby Lake Controller User Data Files

Note: Folder descriptions can also be created by placing a text file with the same name as the folder in the same directory as the folder.

18.4 Designer Worksheets

18.4.1 Overview

The Designer Worksheet provides fast view and update access to the majority of data for a Dolby Lake Processor via a spreadsheet style interface.

These worksheets are available only in Designer Mode, via the module **I/O Config & Worksheets** button.

To access the Designer Worksheets, perform the following steps:

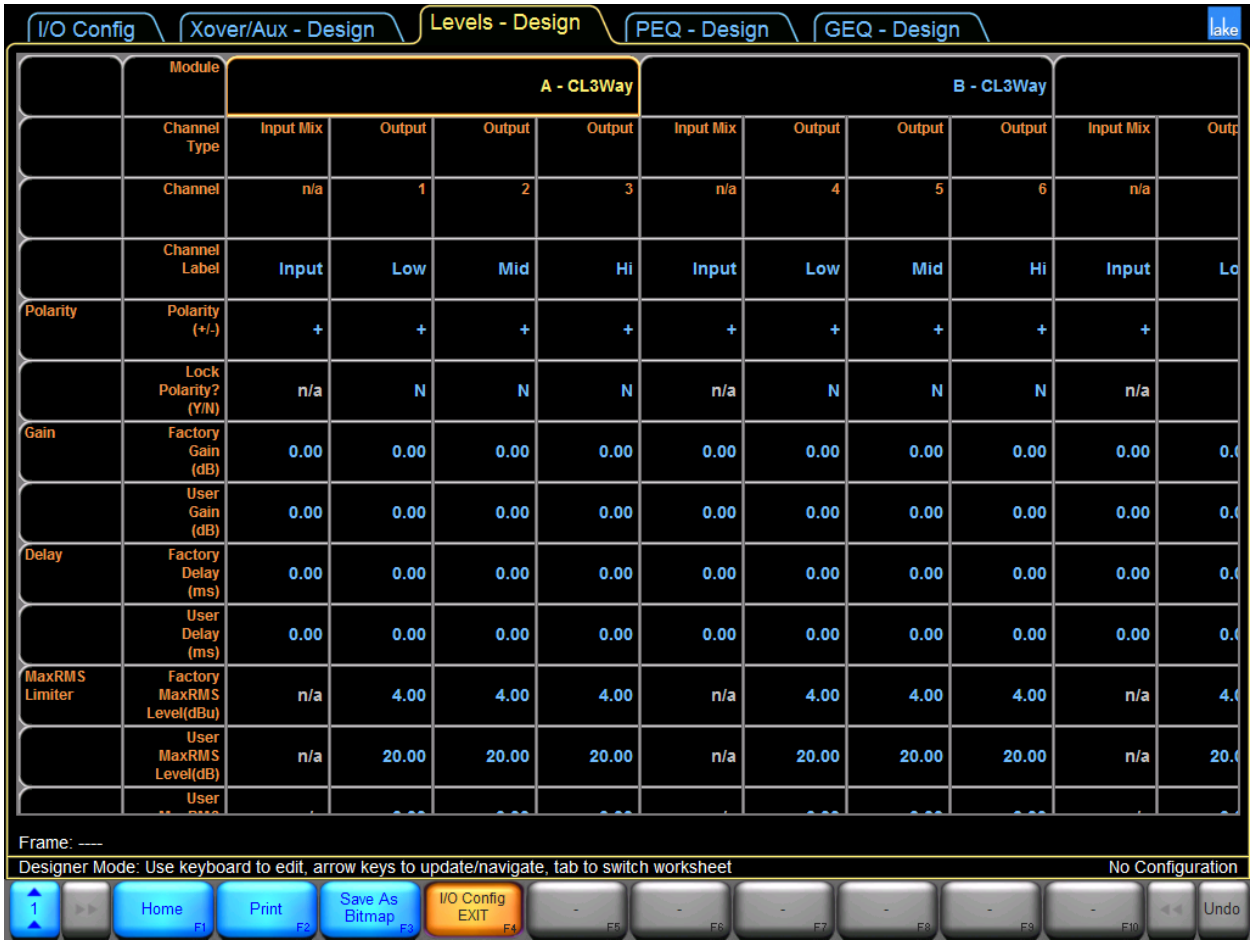
1. From **Home**, tap **Modules**.
2. Tap **I/O Config & Worksheets**.

The following screen tabs are available for loudspeaker modules in Designer Mode:

The following screen tabs are available for Mesa processors in Designer Mode:

3. Tap the **Levels - Design** tab.

Depending on the worksheet/module type, a screen similar to the following will be displayed.



18.4.2 Worksheet Navigation and Data Entry

To navigate to the worksheets, select one of the Design tabs at the top of the screen.

External Keyboard Entry

For fast data entry via the Designer Worksheet, an external keyboard should be attached. Use the arrow keys to navigate around the cells of the worksheet, and enter values and data using the keyboard. The data of the current cell will be verified and updated when you move to the next cell.

Cut/Copy/Paste functionality between cells in the worksheet is available using the following keyboard shortcuts:

- Ctrl + X—Cut
- Ctrl + C—Copy
- Ctrl + V—Paste

Onscreen Keyboard Entry

If a keyboard is not attached, you may select a cell using the touch screen:

1. Single-tap selects the cell.
2. Double-tap displays the onscreen keyboard to allow you to enter the data.

Note: Cell Cut/Copy/Paste functionality is not available without an external keyboard attached.

18.4.3 Xover/Aux: Design (Loudspeaker Modules Only)

The Xover/Aux screens provide access to HPF and LPF frequencies and types (including crossovers) along with output EQ filters and types. The abbreviated codes for this data are listed here with descriptions.

HPF and LPF Types

The same HPF/LPF/Crossover types are allowed via data entry as are allowed via the HPF/LPF/Crossover scroll bars on the Xover page. The following HPF/LPF types are available for the lowest output HPF and highest output LPF:

Table 18-2 HPF and LPF Types

Bessel	Butterworth	Linkwitz-Riley
BE6	BU6	-
BE12	BU12	LR12
BE18	BU18	-
BE24	BU24	LR24

Classic Crossover Types

The following HPF/LPF types are allowed for crossover points only (all HPF/LPF fields except for the HPF on the lowest output channel, and the LPF on the highest output channel for the module).

Table 18-3 Classic Crossover Types

Bessel	Butterworth	Linkwitz-Riley
BE6	BU6	-
BE12	BU12	LR12
BE18	BU18	-
BE24	BU24	LR24
BE30	BU30	-
BE36	BU36	LR36
BE42	BU42	-
BE48	BU48	LR48

Linear Phase Crossover Types

The following HPF/LPF types are allowed for Linear Phase 2-Way and 3-Way module crossover points only (all HPF/LPF fields except for the HPF on the lowest output channel, and the LPF on the highest output channel for the module).

Table 18-4 Linear Phase Crossover Types

Linear Phase 24 dB	Linear Phase 48 dB	Linear Phase Brick Wall
LP24	LP48	LPBW

Note: Linear phase crossovers require both sides of the crossover point to be the same crossover type. Therefore if the one side of the crossover is changed, the other side will change automatically.

Linear Phase Alignment Delay

Unlike most values in the worksheet, Alignment Delay is a module-based value, not a channel-based value. Therefore, when the Alignment Delay value is changed for any channel, all other channels of that module will be updated automatically.

Table 18-5 lists the allowable alignment delays for each module type.

Table 18-5 Alignment Delay

Module Type	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
LP 2-Way and LP 3-Way	1.25 ms	2.5 ms	5 ms	10 ms	20 ms	40 ms
LP 4-Way	3.15 ms	6.29 ms	12.58 ms	25.17 ms	NA	NA

Output EQ Types

Table 18-6 shows the available output EQ type abbreviations, descriptions, and default values.

Table 18-6 Output EQ Types

EQ Type Abbrev.	EQ Type Description	Default Gain (or Order for All Pass Filter)	Default Freq	Default Bandwidth
LS	Low Shelf	0 dB	125 Hz	1.9
BP	Bandpass (Parametric)	0 dB	500 Hz	0.33
AP	All Pass	Second order	800 Hz	0.33
HS	High Shelf	0 dB	8,000 Hz	1.9

18.4.4 HPF/LPF - Design (Mesa EQ Only)

Crossovers, EQ, and All Pass filters are not available on the Mesa EQ **HPF/LPF - Design** screen. The same HPF/LPF types are available for Mesa EQ.

18.4.5 Levels - Design

The data on the **Levels - Design** worksheet is entered by typing the appropriate numerical value into a cell on the worksheet. An error message will be displayed if the value is invalid or incorrect.

To set polarity through the **Levels - Design** worksheet, enter either **+** (positive) or **–** (negative) in the polarity field. The polarity of each output can be independently locked using the **Lock Polarity?** field, which is only available via this worksheet.

To lock polarity of an output, change the value in the associated **Lock Polarity?** field to Y. The example four-way module shown in the following figure has the polarity of all channels locked except for the input and lowest output.

	Output Channel No.	n/a	1	2	3	4
	Channel Label	Input	Low	Low Mid	Hi Mid	Hi
Polarity	Polarity (+/-)	+	+	-	+	-
	Lock Polarity? (Y/N)	n/a	N	Y	Y	Y

When the module is locked, the worksheet will appear as shown in the next figure, and in this example, output polarity for channels 2, 3, and 4 will be locked even in Designer Mode.

	Output Channel No.	n/a	1	2	3	4
	Channel Label	Input	Low	Low Mid	Hi Mid	Hi
Polarity	Polarity (+/-)	+	+	Locked	Locked	Locked
	Lock Polarity? (Y/N)	n/a	N	Y	Y	Y

In User Mode, the worksheets are not available and only the input polarity can be changed via the Levels screens.

18.4.6 PEQ - Design

The **PEQ - Design** worksheet displays the details for each PEQ overlay for the selected Dolby Lake Processor.

Table 18-7 shows the available output EQ type abbreviations, descriptions, and default values.

Table 18-7 EQ Types

EQ Type Abbrev.	EQ Type Description	Default Gain (or Order for All Pass Filter)	Default Frequency	Default Bandwidth
LS	Low Shelf	0 dB	125 Hz	1.9
BP	Bandpass (Parametric)	0 dB	500 Hz	0.33
ME	Mesa Filter	0 dB	830 Hz (low)	0.33
		0 dB	1,200 Hz (high)	0.33
HS	High Shelf	0 dB	8,000 Hz	1.9

Note: The extra fields for the Mesa filter are only editable when a Mesa filter type is entered.

18.4.7 GEQ - Design

The **GEQ - Design** worksheet displays the details for each GEQ overlay for the selected Dolby Lake Processor, including the gain value of each GEQ filter and the bypassed/inserted status of each filter and each overlay.

18.4.8 Locked Modules/Hidden/View Only Data

If data on a module has been hidden or set to view only, and the module has been locked, then the associated data will either be displayed but not editable on the worksheets (for View Only data) or will be replaced with the word **Locked** (for Hidden data).

Firmware Upgrade Process

This chapter describes the process upgrading firmware on the Dolby® Lake® Processor.

19.1 Firmware Upgrade Using the Update Utility

The firmware upgrade utilities allow fast upgrade for large networks of Dolby Lake Processors and Lake Contour™ Pro26 and Mesa Quad EQ™ processors.

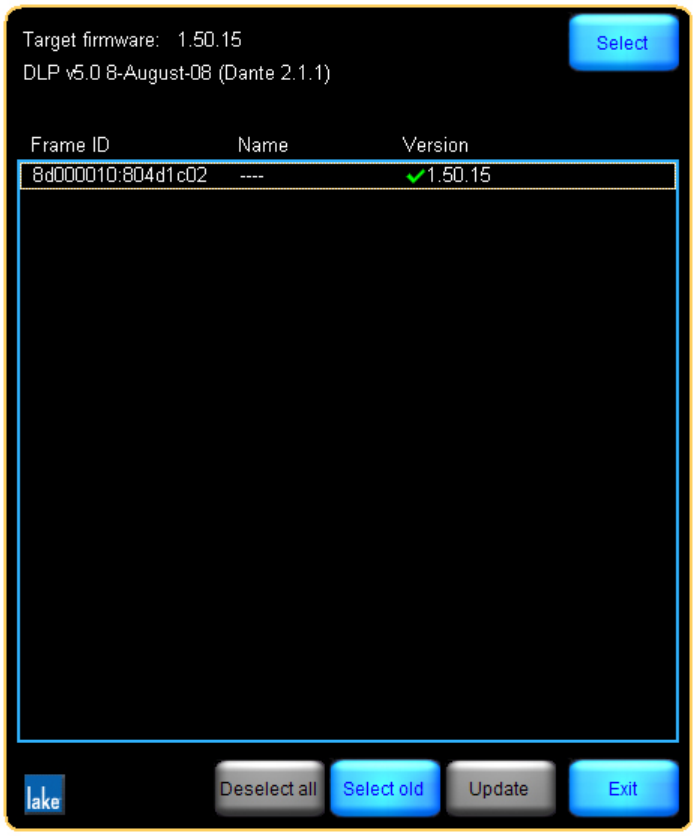
To use the update utility to perform a Dolby Lake Processor firmware upgrade, perform the following steps:

1. Install the latest version of the Controller software.
2. Power on all Processors, and configure using a wired network.
3. Select the Dolby Lake Processor firmware update utility from the **Start → Programs** location. By default, these utilities are located in a folder labeled **Dolby Lake Controller v5.0 → Firmware Update Utilities**.

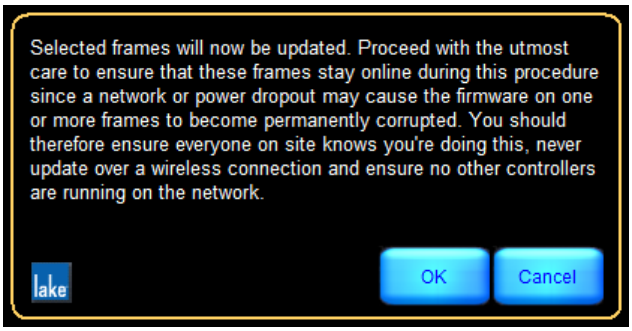
Note: To perform a firmware upgrade on a Contour Pro26 or Mesa Quad EQ unit, tap the appropriate update utility from the Firmware Update Utilities folder.

Please select and use a wired network for performing firmware upgrades. A loss of network connectivity could result in a failed firmware upgrade.

The Processors on the network will appear in a list with their current firmware versions displayed. The firmware version to be loaded is shown at the top of the screen (target firmware); this will default to the latest version available.



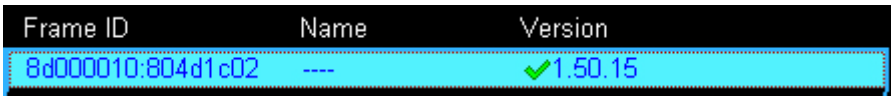
4. Tap **Select old** and then **Update**. A warning message appears.


Selected frames will now be updated. Proceed with the utmost care to ensure that these frames stay online during this procedure since a network or power dropout may cause the firmware on one or more frames to become permanently corrupted. You should therefore ensure everyone on site knows you're doing this, never update over a wireless connection and ensure no other controllers are running on the network.
lake
OK
Cancel

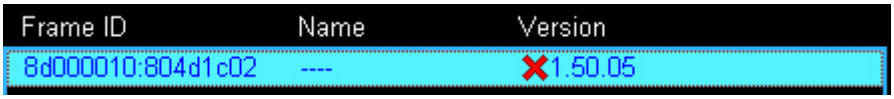
5. Tap **OK** in response to the warning message.

The Processors will be updated with the latest firmware. The percentage value indicates the status of the update of that unit.

A green check mark indicates a successful update, or that the current firmware already matches that selected at the top of the screen:

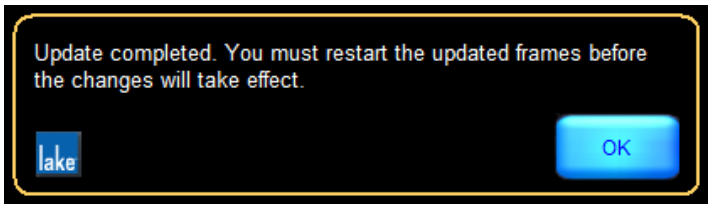


A red cross indicates the firmware has not yet been upgraded to the selected target firmware version:



When you are using the Contour Pro26 or Mesa Quad EQ update utilities, a separate column is displayed for the ARM and DSP updates.

6. Wait for all Processors to be upgraded. A message appears, indicating that you must restart the updated frames.



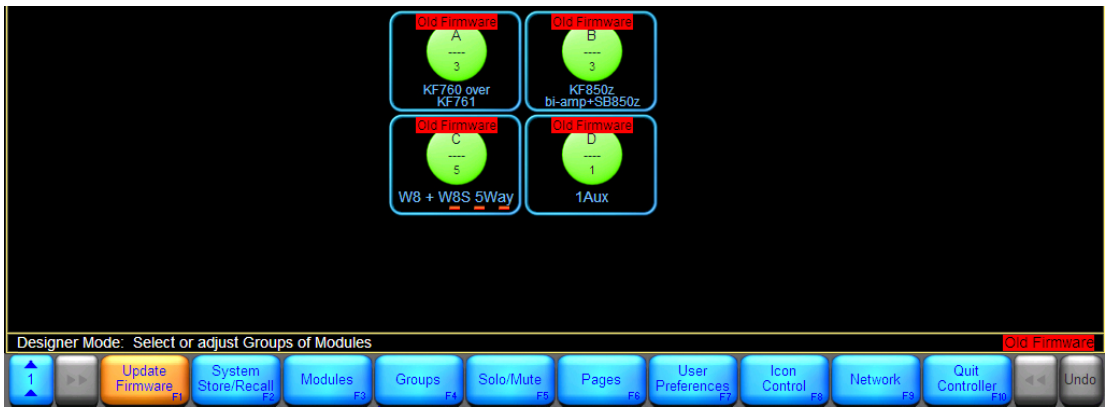
7. Cycle the power of each Processor by turning the power switch off, then back on. This completes the upgrade process and resets the Processor to the default factory configuration.
8. Tap **OK**, then tap **Exit** to quit the firmware update utility.

19.2 Firmware Upgrade Using the Dolby Lake Controller

We recommend using the Dolby Lake Controller software only for upgrading small numbers of Dolby Lake Processors. The Firmware Update Utility provides a faster upgrade process for large networks.

To upgrade firmware using the Dolby Lake Controller software, perform the following steps:

1. Install the latest version of the Dolby Lake Controller.
2. Open the Controller.
3. Tap **Modules**, and drag an old frame from the **Modules** scroll bar into the work area. All modules of the frame will flash indicating it has old firmware and a warning message will appear.
4. Read the warning message, and tap **OK**.
5. Place all old firmware frames in the work area, then tap **Home**.



6. Tap the flashing **Update Firmware** button.
7. Read the onscreen warning message, tapping **Yes** to proceed.

When all Processors have been updated, cycle the power of each unit by turning the power switch off and then back on. This completes the upgrade process and resets the Processor to a default factory configuration.

8. Wait for each Processor to resync following the power cycle.
9. Tap **OK** to the warning message that advises that the backup file will be recalled. This file will reload the Processors with the data that was present prior to the upgrade process.

IP Address Selection

In most applications, the IP addresses and other configuration parameters of the underlying Ethernet system will not need to be adjusted by the end user. If a system requires advanced networking requirements, however, such as the partitioning of a high-bandwidth Ethernet backbone into virtual local area networks (VLANs), then a qualified network engineer may need to make adjustments to the default Ethernet configuration of the Dolby® Lake® Processor and the computer running the Dolby Lake Controller software. This appendix provides reference information pertaining to Ethernet configuration.

A.1 Network Essentials

Ethernet has become a cost-effective and easy-to-configure system for networking personal computers, servers, local area networks (LANs), and industrial and professional equipment, and even provides the fundamental transport backbone of the Internet. Since Ethernet is so widely used for so many applications, there are a number of rules governing the network to ensure that there are no conflicts between multiple devices attempting to compete for bandwidth on the Ethernet network.

IP addresses provide the unique identifier of each "node" on an Ethernet network. The address uniquely identifies the network that the node is on, as well as uniquely identifying the node on that network. In other, more practical terms, the unique identifier ensures that, for example, personal computers all around the world do not clog the Internet with messages intended for local-area data transfers and the like.

Since Ethernet is used both locally and globally, the Ethernet standards have reserved different ranges of IP addresses for various applications. Public IP addresses are used on the Internet, and should not be used in LANs. A range of private IP addresses have also been defined and set aside for use on internal networks. These private IP addresses can be used on internal networks by anyone, as the Internet's backbone routers will not route packets with these addresses.

The Dolby Lake Processor hardware and Dolby Lake Controller software have been developed and tested for use on internal networks that are not intended to be connected to the Internet. Therefore, we recommend that you use private IP addresses when configuring the network.

A.2 Factory Reset Configuration

After starting a Dolby Lake Processor factory reset, the IP address will be set in the Automatic Private IP Address range 169.254.x.x with a subnet mask of 255.255.0.0.

Dante digital audio networking makes use of Apple® Bonjour® zero-configuration networking to automatically identify all Dante devices on the network. It is imperative that Bonjour is installed on the Dolby Lake Controller PC.

The default starting point is for all processors to be left with this factory reset automatic IP address range, with the controller PC configured to "Obtain an IP address automatically". If problems are encountered, or you require a more complex configuration, please refer to a network specialist, and in the case of a Dante audio network, refer also to Dante specific configuration documentation and the Dolby Live Sound forum at http://livesoundforum.dolby.com/.

If desired, you can also use Class A, Class B or Class C private IP address ranges. These addresses require additional configuration, and thus more knowledge of IP addresses and networking. For reference, Table A-1 shows a few private IP address ranges that are recommended for use with the Dolby Lake Processor and Dolby Lake Controller network. We recommend that you configure the network with a private IP address within the ranges shown in Table A-1.

Table A-1 Recommended Private IP Addresses

Class	Range
A	10.x.x.x
B	169.254.x.x (Automatic Private IP Address); Default
B	172.16.x.x through 172.31.x.x
C	192.168.0.x through 192.168.255.x

You can, however, configure Dolby Lake Processors and Dolby Lake Controllers to communicate over a network using any IP address and subnet mask combination required for your particular application. More sophisticated networks that include traffic from other professional and consumer equipment must be configured correctly to achieve desired operation.

Command-Line Options

The Dolby® Lake® Controller provides a number of command-line options to enable or disable certain functionality. These options may be entered when launching the Controller from a command prompt, or may be set using a shortcut's target option.

As an example, the following steps describe how to configure a shortcut on the desktop to launch the Dolby Lake Controller in daylight mode:

1. Right-click on the Microsoft® Windows® desktop and select **New → Shortcut**.
2. When asked to type the location of the item, ensuring that you enclose the location of the Dolby Lake Controller executable in quotation marks, type the following (or the location of your installation):

```
"C:\Program Files\Dolby\Dolby Lake Controller v5.1\Dolby Lake Controller.exe" daylight
```

3. Tap **Next**.
4. When asked to give a name for the shortcut type, enter: **DLC Outdoor**.
5. Tap **Finish**.
6. Double-click the newly created shortcut.

Command Line Options Reference

The following table describes the options for command line functionality.

Option	Description
`aesswap`	Enables the [AES 1/2 - 3/4] swap button on the Lake Mesa Quad EQ™ I/O configuration page.
`daylight`	Forces daylight mode from the start of the Controller.
`fullscreen`	Forces the screen resolution during the controller session to 1024 × 768 16-bit color, instead of the current Windows settings. These changes apply only to the Dolby Lake Controller, and are restored when minimizing or quitting the controller.
`nodblclick`	Disables the use of double-clicking on the menu bar to rename groups or select files.
`nonetfix`	Stops the automatic disabling of unused multiple network adapters in case of communication errors. Only use if you have multiple network cards that you wish to remain active, and beware that this option may cause communication problems, depending on your setup.

Option	Description
`nonfullscreen`	This mode stops the automatic change of any video card settings during the controller session; therefore correct manual settings must be made. The whole screen is still used. This is not a windowed mode option.
`offline`	Forces the Controller into offline mode during start-up so no network adapter is selected.
`Systemmem`	Force the use of system memory instead of video memory to create the worksheets in. Some video adapters cannot hold the worksheets in memory as they may be too wide so this fix will help them.

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